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TRANSACTIONS

OF THE

NATIONAL DENTAL ASSOCIATION.

INCLUDING

MINUTES OF THE CONVENTION RESULTING IN THE FORMATION OF THE NATIONAL DENTAL ASSOCIATION,

AND OF THE

First Meeting,

Held at Old Point Comfort, Va., August 5 and 6, 1897.

PROCEEDINGS

OF THE

SECOND ANNUAL SESSION,

Held at Omaha, Neb., commencing August 30, 1898.

PROCEEDINGS

OF THE FIRST ANNUAL SESSION OF THE

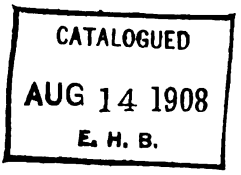
Southern Dental Association—Branch of the National Dental Association,

Held at St. Augustine, Fla., commencing February 22, 1898.

PHILADELPHIA:
THE S. S. WHITE DENTAL MFG. CO.
1899.

DISCLAIMER.

THE NATIONAL DENTAL ASSOCIATION, although formally accepting and publishing the reports of the various Sections, and the Essays read before the Association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when otherwise decided by special resolution.—*Constitution.*



EX-PRESIDENTS OF THE AMERICAN DENTAL ASSOCIATION.

1859*	W. W. ALLPORT	Chicago, Ill.
1860	W. H. ATKINSON	Cleveland, Ohio.
1861	No meeting.	
1862	GEORGE WATT	Xenia, Ohio.
1863	W. H. ALLEN	New York, N. Y.
1864	J. H. MCQUILLEN	Philadelphia, Pa.
1865	C. W. SPALDING	St. Louis, Mo.
1866	C. P. FITCH	New York, N. Y.
1867	A. LAWRENCE	Lowell, Mass.
1868	JONATHAN TAFT	Cincinnati, Ohio.
1869†	HOMER JUDD	St. Louis, Mo.
1870	W. H. MORGAN	Nashville, Tenn.
1871	GEO. H. CUSHING	Chicago, Ill.
1872	P. G. C. HUNT	Indianapolis, Ind.
1873	T. L. BUCKINGHAM	Philadelphia, Pa.
1874	M. S. DEAN	Chicago, Ill.
1875	A. L. NORTHROP	New York, N. Y.
1876	GEO. W. KEELY	Oxford, Ohio.
1877	F. H. REHWINKEL	Chillicothe, Ohio.
1878	H. J. MCKELLOPS	St. Louis, Mo.
1879	L. D. SHEPARD	Boston, Mass.
1880	C. N. PEIRCE	Philadelphia, Pa.
1881	H. A. SMITH	Cincinnati, Ohio.
1882	W. H. GODDARD	Louisville, Ky.
1883	E. T. DARBY	Philadelphia, Pa.
1884	J. N. CROUSE	Chicago, Ill.
1885	W. C. BARRETT	Buffalo, N. Y.
1886	W. W. ALLPORT	Chicago, Ill.
1887	FRANK ABBOTT	New York, N. Y.
1888	C. R. BUTLER	Cleveland, Ohio.
1889	M. W. FOSTER	Baltimore, Md.
1890	A. W. HARLAN	Chicago, Ill.
1891	W. W. WALKER	New York, N. Y.
1892	J. D. PATTERSON	Kansas City, Mo.
1893	Formal session only, owing to the holding of the World's Columbian Dental Congress; officers elected in 1892 held over until 1894.	
1894	J. Y. CRAWFORD	Nashville, Tenn.
1895	J. Y. CRAWFORD	Nashville, Tenn.
1896	JAS. TRUMAN	Philadelphia, Pa.

*First meeting, for organization.

†Owing to a change in the Constitution, officers elected at this and the sessions following, served at the next annual meeting subsequent to their election.

EX-PRESIDENTS OF THE SOUTHERN DENTAL ASSOCIATION.

1869*	W. T. ARRINGTON	Memphis, Tenn.
1870	W. T. ARRINGTON	Memphis, Tenn.
1871	JAS. S. KNAPP	New Orleans, La.
1872	F. Y. CLARK	Savannah, Ga.
1873	H. M. GRANT	Abingdon, Va.
1874	ROBT. ARTHUR	Baltimore, Md.
1875	J. R. WALKER	New Orleans, La.
1876	W. T. ARRINGTON	Memphis, Tenn.
1877	W. G. REDMOND	Louisville, Ky.
1878	S. J. COBB	Nashville, Tenn.
1879	F. J. S. GORGAS	Baltimore, Md.
1880	J. B. PATRICK	Charleston, S. C.
1881	V. E. TURNER	Raleigh, N. C.
1882	E. S. CHISHOLM	Tuscaloosa, Ala.
1883	L. D. CARPENTER	Atlanta, Ga.
1884	H. J. MCKELLOPS	St. Louis, Mo.
1885	A. O. RAWLS	Lexington, Ky.
1886	W. C. WARDLAW	Augusta, Ga.
1887	W. W. H. THACKSTON	Farmville, Va.
1888	B. H. CATCHING	Atlanta, Ga.
1889	J. Y. CRAWFORD	Nashville, Tenn.
1890	JOHN C. STOREY	Dallas, Texas.
1891	G. F. S. WRIGHT	Georgetown, S. C.
1892	GORDON WHITE	Nashville, Tenn.
1893	B. HOLLY SMITH	Baltimore, Md.
1894	Same officers hold over.	
1895	H. E. BEACH	Clarksville, Tenn.
1896	JOHN S. THOMPSON	Atlanta, Ga.
1897	W. H. RICHARDS	Knoxville, Tenn.
1898†	E. P. BEADLES	Danville, Va.

*First meeting for organization; Jas. S. Knapp, Chairman *pro tem.*

†First President of the Southern Dental Association as a branch of the National Dental Association, organized August, 1897, by the consolidation of the American Dental Association and the Southern Dental Association.

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Minutes of the Convention Resulting in the Formation of the National Dental Association.

By W. E. WALKER.

Old Point Comfort, Aug. 5, 1897.

The members of the American Dental Association and of the Southern Dental Association met in convention in the ballroom of the Hygeia Hotel, Old Point Comfort, Virginia, at 2.30 P.M., on Thursday, August 5, 1897, for the purpose of forming a new dental association, through the union of the American and Southern Dental Associations.

Dr. Thomas Fillebrown, Chairman of the Committee on Union of the American Dental Association, called the convention to order. Dr. John B. Rich, of Washington, D. C., was chosen Chairman, and Drs. W. E. Walker, of Pass Christian, and Geo. H. Cushing, of Chicago, were chosen Secretaries.

Dr. J. D. Patterson introduced the following resolution, which was adopted:

Resolved, That the members of the American Dental Association and the members of the Southern Dental Association do hereby organize themselves into a body to be known and styled the National Dental Association.

The following resolution was offered by Dr. Marshall:

Resolved, That the Constitution, By-Laws, and Rules of Order, decided upon and presented by the joint committee of these two bodies be and are hereby adopted as the Constitution, By-Laws, and Rules of Order of the National Dental Association.

Before this motion was put the following, introduced by Dr. Richards, was after some discussion adopted:

Resolved, That no speaker shall occupy the floor for more than three minutes without the consent of a majority of this body.

Dr. Marshall's resolution was then adopted.

Dr. Brophy moved that we proceed to the election of officers.

Dr. Taft moved a reconsideration of the action by which the Constitution was adopted.

After discussion, Dr. Taft, with the consent of his second, withdrew his motion.

Dr. C. N. Peirce moved that the committee which formulated the Constitution and By-Laws make nominations for officers for the coming year, to be presented to the convention for its action.

Dr. H. E. Beach pointed out the provision of the Constitution requiring that nominations be made by informal ballot.

Dr. L. Ottofy moved that Dr. Brophy's motion be laid on the table. So ordered.

Dr. E. P. Beadles moved that the Secretary read the Constitution and By-Laws, which motion prevailed, and they were read by the Secretary.

Dr. Ottolengui moved that Dr. Brophy's motion be taken from the table, and that we now proceed to the election of officers, which motion prevailed, and Drs. Hunt and Noble were appointed tellers.

On the informal ballot, Dr. Fillebrown receiving fifty-one out of ninety-two votes cast, the informal ballot was made formal and Dr. Fillebrown was declared the President of the National Dental Association.

Dr. Richards, the retiring President of the Southern Dental Association, and Dr. Truman, the retiring President of the American Dental Association, were appointed to escort the newly-elected President to the chair.

It was voted to take a recess for dinner, to reconvene at 4.30 P.M.

National Dental Association.

FIRST MEETING.

The Association was called to order at 4.30 P.M., pursuant to adjournment, by the President, Dr. Fillebrown.

The election of officers was proceeded with.

On motion it was decided to ballot for the Recording Secretary before any other officers.

Drs. Hunt and Noble were appointed tellers. Dr. Geo. H. Cushing, of Chicago, was elected.

Dr. Cushing here assumed his duties, and the minutes from this to the close of the session are by him.

On motion of Dr. Crawford, by unanimous consent, it was decided to appoint an Assistant Secretary.

On motion of Dr. Peirce the Secretary was instructed to cast the vote for Dr. W. E. Walker for Assistant Secretary.

Proceeded to ballot for Vice-President for the East.

On motion the Secretary was instructed to cast the vote for Dr. James McManus, of Hartford, who was thus duly elected.

Balloting for Vice-President from the West resulted in the election of Dr. L. L. Dunbar, of San Francisco.

The ballot for Vice-President from the South resulted in the election of Dr. B. Holly Smith, of Baltimore.

On motion, the Secretary was instructed to cast the ballot for Dr. Emma Eames Chase for Corresponding Secretary.

The Secretary was instructed by vote to cast the ballot for Dr. H. W. Morgan, of Nashville, for Treasurer.

Dr. Beadles, of Virginia, moved that the President cast the ballot for the entire Executive Committee. Carried.

The following were elected:

For the South, L. G. Noel, M. F. Finley, and George Eubank; for the West, J. N. Crouse, W. P. Dickinson, and J. D. Patterson; for the East, C. N. Peirce, H. A. Smith, and V. H. Jackson.

Drs. Eubank, Dickinson, and Peirce serve for one year, Drs. Finley, Patterson, and Smith for two years, and Drs. Crouse, Noel, and Jackson for three years.

The selection of place of next meeting now being in order, Denver, Omaha, and Minneapolis were nominated. Omaha was selected.

The following resolution was adopted:

Resolved, That the Treasurer of this Association be directed to request the Treasurers of the American Dental Association and of the Southern Dental Association to furnish him with the lists of the permanent members of their respective Associations, and he is hereby directed to add the names so furnished him to the Constitution of this Association as set forth in the provisions of membership in Article III, Section 5, of the Constitution; and be it further

Resolved, That said act of the Treasurer shall be legal and binding the same as if the signatures had been attached by the persons themselves.

The following was adopted:

Resolved, That a committee of three be appointed by the President of this Association to take into consideration the question of establishing a journal for the publication of the transactions of this Association and other original matter pertaining to dental surgery and the collateral sciences, and that they report to this body at the next annual meeting.

The following resolution was presented by Dr. Crawford:

Be it Resolved, That it is the sense of the National Dental Association that when any member of the dental profession, in good standing, presents a certificate of registration from any State in the Union, that the same should be admitted to registration in any other State without additional examination.

On motion, the President, Dr. Fillebrown, was authorized to have printed as many copies of the Constitution and By-Laws as he may deem necessary.

On motion, it was resolved that when we adjourn it shall be to meet to-morrow at 12 M., at the Chamberlin Hotel.

The following was adopted:

Resolved, That the two Associations participating in this organization be requested to contribute from their respective treasuries to the treasury of the National Dental Association the sum of one dollar per member for all members whose dues are fully paid; and in view of this contribution, the dues of all such members of the National Dental Association for the year 1897 shall be remitted.

The following resolution, offered by Dr. R. Finley Hunt, was adopted:

Resolved, That a committee of three be appointed by the President to report at the next annual meeting a measure looking to the preparation of a full history of the dental profession.

On motion, adjourned till 12.30 to-morrow.

Thursday Noon.

The Association met according to adjournment at 12.30; the President, Dr. Fillebrown, in the chair.

The minutes of yesterday were read and approved.

The following committees were announced:

ORGANIZATION OF THE EXECUTIVE COMMITTEE.—J. N. Crouse, *Chairman;* M. F. Finley, *Secretary.*

FIRST DIVISION. COMMITTEE OF ARRANGEMENTS.—J. N. Crouse, L. G. Noel, and H. A. Smith.

SECOND DIVISION. CREDENTIALS AND AUDITING COMMITTEE.—V. H. Jackson, J. D. Patterson, M. F. Finley.

THIRD DIVISION. COMMITTEE ON VOLUNTARY ESSAYS.—C. N. Peirce, W. P. Dickinson, George Eubank.

Publication Committee.—A. W. Harlan, V. E. Turner.

Committee on National Museum and Library.—Williams Donnally, H. W. Morgan, and T. Fillebrown.

Committee on Terminology.—S. H. Guilford, Grant Molyneaux, and S. W. Foster.

Committee on Journal.—J. S. Marshall, J. Taft, L. G. Noel.

Committee on History.—Charles McManus, R. Finley Hunt, and Gordon White.

The Sections were organized and finally completed as follows:

SECTION I. Prosthetic Dentistry, Chemistry and Metallurgy.—Grant Molyneaux, Chairman; R. R. Freeman, Secretary. W. S. Smith, Henry McManus, Louis C. Le Roy, Howard S. Seip, J. Hall Moore, George H. Wilson, P. J. Wilson, Herbert C. Miller, A. P. Johnstone, William Ernest Walker, William S. Hosford, George M. Whitfield, D. D. Smith, George Evans, J. N. Van De Water, J. Rollo Knapp, S. E. Gilbert, T. S. Waters, W. H. Fundenberg, C. Edmund Kells, Jr., H. S. Sutphen, S. A. Freeman, Jules J. Sarrazin, J. A. Hall, N. D. Edmonds, George W. Warren, J. Edwin Boozer, C. H. Frink, E. G. Quattlebaum, Ralph B. Reitz, J. V. Haller, T. M. Allen, S. W. Allen, H. L. Ambler, L. Augspath, J. W. Ayers, Boyd H. Baker, L. L. Barber, U. D. Billmeyer, J. Adams Bishop, E.

A. Bogue, Alonzo Boice, H. H. Boswell, C. T. Brockett, I. N. Broomell, C. J. Essig, D. E. Everitt, George Eubank, W. H. Ewald, George L. Field, J. G. Fife, W. B. Finney.

SECTION II. Dental Education, Literature, and Nomenclature.—B. H. Catching, Chairman; M. F. Finley, Secretary. H. T. Smith, Jacob L. Williams, L. Ashley Faught, Eugene H. Smith, Charles McManus, Frank G. Gregory, Thomas C. Stellwagen, C. N. Peirce, S. H. Guilford, J. Hall Moore, Henry W. Morgan, J. Taft, William A. Montell, F. T. Murlless, Jr., C. D. Cook, Edward C. Kirk, D. D. Smith, L. D. Shepard, A. O. Hunt, S. E. Gilbert, H. S. Sutphen, B. D. Brabson, W. W. H. Thackston, H. H. Johnson, T. M. Allen, H. L. Ambler, L. L. Barber, J. Adams Bishop, E. A. Bogue, C. T. Brockett, A. J. Brown, H. J. Burkhart, C. S. Butler, Allen R. Carr, I. N. Carr, C. S. Case, J. S. Cassidy, W. G. Chase, C. C. Chittenden, Dwight M. Clapp, W. R. Clifton, S. B. Cook, W. H. Cook, J. P. Corley, L. M. Cowardin, T. E. Craddock, William Crenshaw, J. N. Crouse, G. L. Curtis, E. T. Darby, L. L. Dunbar, W. St. George Elliott, Charles J. Essig, George L. Field, W. H. Morgan.

SECTION III. Operative Dentistry.—J. Y. Crawford, Chairman; Frank Holland, Secretary. C. N. Johnson, Corydon Palmer, P. S. Bollinger, H. T. Smith, L. P. Bethel, S. Freeman, S. G. Perry, J. I. Hart, L. C. Taylor, W. S. How, Harvey Iredell, E. S. Gaylord, S. C. G. Watkins, A. J. Prosser, James McManus, Louis C. Le Roy, Charles K. Van Vleck, H. Barnes, A. H. Fuller, G. W. Hoysradt, W. E. Page, Howard S. Seip, S. H. Guilford, J. Hall Moore, P. J. Wilson, Earl P. Hawes, H. B. Tileston, William Conrad, S. B. Palmer, H. G. Ulrich, B. Eugene Holcombe, J. T. Lippincott, B. Holly Smith, Thomas T. Moore, J. Percy Corley, R. J. Hart, B. H. Baker, Thomas Fillebrown, Louis Jack, B. F. Luckey, D. D. Smith, G. L. S. Jameson, J. W. Meng, S. E. Gilbert, T. S. Waters, C. H. Harroun, W. F. Fundenberg, S. L. Goldsmith, H. S. Sutphen, Robt. I. Verplanck, B. Oscar Doyle, C. L. Alexander, Jules J. Sarrazin, W. Woolsey, C. S. Stockton, F. L. Wood, F. P. Welch, W. W. Shryock, M. B. Culver, V. E. Turner, I. Simpson, Thomas T. Moore, J. D. Pfeifer, A. R. Melendy, L. Augspath, J. W. Ayers, J. Adams Bishop, C. T. Brockett, A. J. Brown, H. J. Burkhart, C. S. Butler, C. R. Butler, Allen R. Carr, I. N. Carr, W. G. Chase, C. C. Chittenden, Dwight M. Clapp, W. R. Clifton, S. B. Cook, W. H. Cook, T. E. Craddock, William Crenshaw, J. N. Crouse, George H. Cushing, E. T. Darby, L. L. Dunbar, W. St. George Elliott, George L. Field, S. W. Foster, W. B. Finney, John E. Frazier, G. J. Friedrichs, Leo Greenbaum, Charles S. Grindall, O. J. Gross, T. S. Hacker, James H. Harris, J. S. Hardy, H. F. Harvey, Joseph Head, Thomas P. Hinman, J. E. Hinkins, D. M. Hitch, N. S. Hoff, Frank Holland, George E. Hardy, George E. Hunt, Robert Huey, Lee F. Huffman, Henry A. Hull, J. Searle Hurlbut, C. S. Inglis, Harvey Iredell, W. T. Jackman, F. A. Remington, B. J. Pressey, J. B. Pressey, J. W. Quattlebaum, C. B. Rohland, John B. Rich, W. E. Richardson, W. H. Richards, N. J. Roberts, D. N. Rust, B. Rutledge, R. M. Sanger, S. P. Sharp, N. T. Shields, A. H. Sibley, Charles Sill, H. H. Sisson, B. Holly Smith, J. W. Smith, H. A. Smith,

M. B. Straight, John F. Stephan, B. Q. Stevens, R. A. Talbot, J. G. Templeton, Henry C. Thompson, J. S. Thompson, J. L. Walker, R. H. Walker, W. E. Walker, William Wallace Walker, J. W. Wassall, W. C. Wendel, T. L. Westerfield, T. P. Whitby, J. H. White, T. C. Wilson, J. L. Wolf, G. F. S. Wright.

SECTION IV. Histology and Microscopy.—I. P. Wilson, Chairman; Thomas P. Hinman, Secretary. L. P. Bethel, Louis C. Le Roy, Charles K. Van Vleck, A. F. Sonntag, H. Jerome Allen, S. E. Gilbert, A. J. Brown, C. S. Butler, I. N. Carr, W. G. Chase, W. H. Cook, J. A. Dale, E. T. Darby, I. B. Davenport, J. W. David, B. Douglass, L. L. Dunbar, A. R. Eaton, Edward Eberle, Edward Eggleston, John E. Frazier.

SECTION V. Materia Medica and Therapeutics.—J. S. Cassidy, Chairman; L. P. Bethel, Secretary. A. W. Harlan, S. Freeman, James Truman, W. A. Price, Wilbur F. Litch, W. E. Griswold, S. E. Gilbert, A. H. Peck, C. R. Jefferis, A. R. Starr, H. S. Sutphen, M. W. Foster, N. S. Hoff, E. S. Holmes, B. E. Holcombe, George E. Hunt.

SECTION VI. Physiology and Etiology.—J. D. Patterson, Chairman; L. E. Custer, Secretary. W. S. How, L. Ashley Faught, Louis C. Le Roy, Emma Eames Chase, Thomas C. Stellwagen, M. L. Rhein, S. E. Gilbert, H. A. Smith, J. Howard Gaskill, J. Newton Giddens, A. H. Gilson, N. J. Goodwin, C. W. Granger, Leo Greenbaum, Meta T. Haley, R. Finley Hunt, Robert Huey, H. H. Jackson, H. R. Jewett, A. P. Johnstone, G. E. Johnson, R. H. Jones, Henry C. Jones, R. V. Jones, Victor S. Jones, H. H. Keith, R. N. Kesterson, A. B. King, Edward M. Kettig, Samuel E. Knowles.

SECTION VII. Anatomy, Pathology and Surgery.—W. C. Barrett, Chairman; George Clement, Secretary. John S. Marshall, L. P. Bethel, T. W. Brophy, J. D. Thomas, C. A. Brackett, Frank G. Gregory, W. H. Whitslar, M. L. Rhein, M. C. Smith, S. B. Dewey, Thomas Fillebrown, T. T. Hayward, A. O. Hunt, S. E. Gilbert, F. A. Shotwell, C. P. Pruyn, T. L. Gilmer, W. T. McLean, Thomas T. Moore, J. H. Benton, A. G. Friedrichs, H. A. Lowrance, J. Thomas Lippincott, John D. Loetzerich, B. F. Luckey, W. A. Lyons, R. Maercklein, E. B. Marshall, F. J. Maynard, Theodore Menges, W. H. Morgan, L. G. Noel, A. L. Northrop, J. E. Orrison, T. H. Parramore, F. A. Remington.

SECTION VIII. Hygiene and Prophylactic Dentistry.—W. T. Arrington, Chairman; A. H. Thompson, Secretary. Louis C. Le Roy, H. G. Ulrich, J. Taft, T. T. Hayward, S. E. Gilbert, Williams Donnally, F. H. McAnnally, H. C. McBrair, H. J. McBride, H. B. McFadden, George S. Nason, J. J. Nelson, H. B. Noble.

SECTION IX. Orthodontia.—V. H. Jackson, Chairman; L. P. Dotterer, Secretary. Louis Ottofy, L. C. Taylor, W. E. Grant, Louis C. Le Roy, Frank G. Gregory, R. Ottolengui, S. H. Guilford, M. C. Smith, J. W. Canaday, J. N. Van De Water, W. N. Cogan, C. L. Goddard, W. H. Fundenberg, Jules J. Sarrazin, L. D. Carpenter, Gordon White, H. E. Beach, C. S. Case, H. B. Noble.

SECTION X. Clinics.—H. J. McKellops, Chairman; E. P. Beadles, Sec-

retary. L. C. Taylor, William Conrad, M. B. Culver, J. Edwin Boozer, I. Simpson, S. Dickson.

The following standing resolution was adopted:

Resolved, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in this Association without the payment of dues; and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

The following was adopted:

Resolved, That the Committee on National Dental Library and Museum be authorized to seek in the interest of public health, at government expense, the appointment in the Army Medical Library and Museum of at least one dentist of eminent fitness, whose time when so employed shall be devoted to the advancement of dental science.

The following was adopted:

Resolved, That a committee of three be appointed whose duty it shall be to confer with State and local societies and to aid and foster new societies when and where desirable.

The President appointed as that Committee, J. Taft, J. Y. Crawford, and James McManus.

On motion of Dr. Crawford, the Association authorized the publication of all the proceedings of this body as a supplement to the transactions of the American and of the Southern Dental Associations.

The following motion prevailed:

Resolved, That a committee be appointed from this Association consisting of one member from each State and Territory to work in the interest of the Dental Protective Association.

The Committee as named is as follows:

Alabama.—W. J. Reynolds, Selma.
California.—L. A. Teague, San Francisco.
Colorado.—P. T. Smith, Denver.
Connecticut.—C. P. Graham, Middletown.
Florida.—W. A. McQuaig, Lake City.
Georgia.—J. A. Chapple, Atlanta.
Illinois.—J. A. Davis, Galesburg.
Indiana.—W. L. Rawls, Indianapolis.
Iowa.—K. M. Fullerton, Cedar Falls.
Kansas.—J. P. Root, Kansas City.
Kentucky.—J. H. Letcher, Danville.

Maine.—F. A. Burnham, Saco.
Maryland.—F. F. Drew, Baltimore.
Massachusetts.—W. E. Boardman, Boston.
Michigan.—A. W. Diack, Detroit.
Minnesota.—W. D. James, Tracy.
Mississippi.—P. N. Wright, Senatobia.
Missouri.—J. T. Fry, Moberly.
Nebraska.—J. S. McCleery, Beatrice.
New Hampshire.—W. R. Blackstone, Manchester.
New Jersey.—J. L. Crater, Orange.
New York.—H. J. Burkhart, Batavia.
North Carolina.—H. V. Horton, Winston.
North Dakota.—H. L. Starling, Fargo.
Ohio.—L. E. Custer, Dayton.
Pennsylvania.—W. F. Litch, Philadelphia.
Rhode Island.—E. P. Robinson, Newport.
South Carolina.—J. C. Oeland, Spartanburg.
Tennessee.—W. H. Richards, Knoxville.
Texas.—J. L. Buchanan, Bonham.
Vermont.—C. S. Campbell, St. Albans.
Virginia.—J. V. Haller, Wytheville.
Washington.—R. B. Gentle, Olympia.
West Virginia.—Robert Tever, Wheeling.
Wisconsin.—R. G. Richter, Milwaukee.

On motion, adjourned to 2 P.M.

Afternoon Session. Thursday.

Association was called to order at 2 P.M., the President in the chair.

The minutes of the morning session were read and approved.

The following notices of proposed amendments were filed:

By J. Y. Crawford,—

To change the name of this Association from The National Dental Association to The American Association of Dental Surgeons.

By Dr. Guilford,—

To change the name from that of National Dental Association to that of The American Association of Dental Science.

By Dr. Stellwagen,—

To amend Article I by striking out the words "National Dental" and inserting in their place the words "American Stomatological."

The minutes were finally read and approved, and the Association adjourned to meet at Omaha the first Tuesday after the last Saturday in August, 1898. GEORGE H. CUSHING, *Secretary.*

Constitution and Rules of Order of the National Dental Association.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the science of dentistry, and have adopted the following Constitution and Rules of Order for our government:

CONSTITUTION.

ADOPTED AUGUST, 1897.

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them mutual improvement, social intercourse, and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

SECTION 1. The members of this Association shall be of three classes, —viz, permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

SEC. 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

SEC. 3. All delegate members shall be practitioners of dentistry. They shall be received only from permanently organized State dental societies. They shall be elected by ballot at some regular meeting of their society, and shall be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

SEC. 4. Honorary members shall consist of prominent worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

SEC. 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belonged, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

SECTION 1. Each State society may send one for every ten of its active members as delegates to this Association for one year, upon complying with the requirements of its Constitution; but no society shall be entitled to representation that does not adopt or substantially recognize the Code of Ethics of this Association.

SEC. 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SEC. 3. If the Committee on Credentials has knowledge that any applicant for membership is violating the Code of Ethics, said applicant shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SEC. 4. This Association will receive no delegates who, since August, 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment.

DUES.

SEC. 2. The annual dues for membership in this Association shall be five dollars.

DUES—TO BE PAID.

SEC. 3. No member is eligible to office, nor can he speak or vote in this Association or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SEC. 4. If the dues of any member remain unpaid for two years, his name shall be erased from the list of members of this Association.

CONDUCT OF MEMBERS.

SEC. 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained to report at the next meeting of the annual session at which the charges are preferred. Whereupon, by a vote, the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SEC. 6. Any member of this Association being expelled or suspended from his local society shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SEC. 7. Any member not in arrears may offer his resignation, upon the acceptance of which his membership shall cease; but the Association may at any time thereafter reinstate such member by unanimous consent.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and an Executive Committee consisting of nine members.

TERM OF OFFICE.

SEC. 2. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

ELECTION OF OFFICERS.

SEC. 3. The President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and members of the Executive Committee shall be elected by ballot in open session of the Association. Three members of the Executive Committee shall be chosen from each division.

After 1897 the President shall be chosen from the division in which the meeting is being held.

SEC. 4. One of the Vice-Presidents shall be chosen from each section, namely, one from the East, one from the West, and one from the South, and shall rank by seniority.

SEC. 5. The candidates for President and Vice-Presidents shall be nominated by an informal ballot of the Association. The three names, or, in case of a tie, the four names, having the greatest number of votes shall be the sole nominees.

A formal ballot shall then be taken, in which a majority of the ballots cast shall be necessary to a choice.

The informal ballot may be made formal by a three-fourths vote of the members present.

ARTICLE VII.

DUTIES OF OFFICERS.

Duties of President.

SECTION 1. The President shall preside according to parliamentary usage as laid down in "Roberts's Rules of Order" and the rules of order adopted by this Association, and shall present an annual address.

Duties of Vice-Presidents.

SEC. 2. In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in the absence of these officers a chairman *pro tem.* shall be appointed by the Executive Committee.

Duties of Corresponding Secretary.

SEC. 3. The Corresponding Secretary shall attend to the correspondence of the Association with the societies therein represented, and with other scientific bodies as may be desirable.

Duties of Recording Secretary.

SEC. 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be *ex-officio* chairman of the Publication Committee, and shall see that due notice is given of the time and place of the meetings of the Association.

Duties of Treasurer.

SEC. 5. The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the meeting of the Executive Committee at 8 A.M. on the day of the annual meeting to receive dues, and shall attend at roll-call to verify the list of names, checking all such as are in arrears for dues; he shall restore such names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigned by the President, and shall report to the Executive Committee, where his accounts shall be audited and by whom his report shall be presented to the Association, together with their own.

SEC. 6. All resolutions appropriating money, except for the legitimate expenses of this Association, shall require a two-thirds vote of all the members present.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall consist of nine members, and shall be the business committee of the Association, to whom shall be referred all business not otherwise specially provided for. They shall report at each meeting, under the proper head, their doings for the current year.

CLASSIFICATION OF EXECUTIVE COMMITTEE.

SEC. 2. At the first election of the Executive Committee the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward three new members shall be elected each year by ballot, one from each division, to serve three years, and in case of the absence of any member of this committee his place may be temporarily filled by the remaining members of the committee.

SUB-DIVISION OF EXECUTIVE COMMITTEE.

SEC. 3. The Executive Committee shall meet after the election of new members to choose their own chairman and secretary, and to divide themselves into sub-committees of three each, as follows, and for the purposes described:

First Division.—Committee of Arrangements.

SEC. 4. The first division of this committee shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, of which they shall have the charge. These three shall provide a book for the registration of members or visitors as they arrive, with the place of their residence and hotel address, and shall attend to the general wants of the Association during its session; and it shall be their further duty to secure from the Treasurer a good and sufficient bond.

Second Division.—Credentials and Auditing Committee.

SEC. 5. The second division shall examine and verify the credentials and qualifications of members, including all violations of the Code of Ethics and the Constitution, and shall also be the Auditing Committee for that year.

Third Division.—Committee on Volunteer Essays.

SEC. 6. The third division shall examine all volunteer essays, and before they are read to the Association shall give their approval, in order that time may not be taken up by unworthy or irrelevant matter.

They shall report names of places for the next meeting of the Association.

REPORTS OF SUB-COMMITTEES.

SEC. 7. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report if possible; but in case of their inability to decide upon any matter, it shall be brought before the Association for its decision as early as practicable.

MEETINGS OF EXECUTIVE COMMITTEE.

SEC. 8. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association, and shall meet for the examination of credentials and the reception of papers, and such other business as may properly come before them, at 8 A.M. on the first day of the annual meeting.

CHAIRMAN MAY CONVENE THE COMMITTEE.

SEC. 9. The chairman of the Executive Committee may at his own discretion summon the members thereof to a meeting at any suitable hour during the sessions of the Association, and at any other time at the request of five members of the committee.

ARTICLE IX.

LOCAL COMMITTEE OF ARRANGEMENTS.

SECTION 1. There shall be appointed by the President annually a committee of three residing at or near the place selected for the next meeting, whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be needed for the Association.

PUBLICATION COMMITTEE, HOW APPOINTED.

SEC. 2. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The committee shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SEC. 3. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Association may direct, or the committee judge to be of sufficient value. They shall specify in the annual report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand.

SEC. 4. Any report or other paper, to be entitled to publication in the volume of the transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee within twenty days after the close of the annual session, and must also be so prepared that the proof sheets furnished the authors shall be returned to the committee without material alteration or addition.

SEC. 5. Every paper received by this Association, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published for its benefit.

DISCLAIMER.

SEC. 6. The Publication Committee is hereby instructed to print at the beginning of each volume of the transactions the following disclaimer,—viz, "The National Dental Association, although formally accepting and publishing the reports of the various Sections and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE X.

QUORUM.

Fifteen members shall constitute a quorum for the transaction of business in this Association.

ARTICLE XI.

SUSPENSION OF RULES.—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XII.

TIME AND PLACE OF MEETINGS.

SECTION 1. The regular meetings of this Association shall be held annually on the first Tuesday after the last Saturday in August, or at such time as shall be determined by ballot of the Association.

SEC. 2. The place of meeting shall be determined each year by vote of the Association, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter in the order named, meeting in each section every third year.

SEC. 3. For the purposes of this Association, the United States shall be divided into three divisions, to be called The East, The South, and The West.

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, lower peninsula of Michigan, and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma, and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico, and Alaska.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

SECTION 1. This Association shall be divided into ten Sections, as follows:

1. Prosthetic Dentistry, Metallurgy, and Chemistry, including Crown- and Bridge-Work.
2. Dental Education, Literature, and Nomenclature.
3. Operative Dentistry.
4. Histology and Microscopy.
5. Materia Medica and Therapeutics.
6. Physiology and Etiology.
7. Anatomy, Pathology, and Surgery.

8. Hygiene and Prophylactic Dentistry.
9. Orthodontia.
10. Clinics.

SEC. 2. It shall be the duty of each member to identify himself with one or more of the above-named Sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association. At the close of the morning session of the second day of the annual meeting, the roll of permanent members in good standing shall be called for the annual reorganization of the Sections.

SEC. 3. The Secretary shall assign members to the Sections in which they are expected to work if they shall fail to make their own choice.

SEC. 4. It shall be the duty of the Recording Secretary, immediately at the close of the morning session of the second day, to present lists of the names of each Section, as a basis for the organization of the Sections.

SEC. 5. The officers of each Section shall be a chairman and secretary, who shall be appointed by the President upon nomination by the Executive Committee, and shall be members known to be capable and interested in the performance of the duties of the offices.

SEC. 6. The chairman of each Section shall preside at all of its meetings; shall exercise general supervision over the business, and shall see that the labors of his Section are conducted in the manner calculated to secure the best results. The chairman, and such other member or members as the Section shall select, shall prepare and read at the annual meeting of the Association next ensuing a paper or papers on the advances and discoveries of the past year in the branches included in the Section. The reading of such papers shall not together occupy more than forty minutes.

SEC. 7. The several Sections shall meet at 10 A.M. on the morning of the first day of the annual meeting of the Association.

SEC. 8. For the information of all members, a list of the members of each Section shall be published in the Transactions of each year.

SEC. 9. The reports of the Sections shall be called by the President in consecutive order, beginning each succeeding year one number higher than on the preceding year, and no Section having been called and passed shall be again heard, until all others have been called.

ARTICLE XIV.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SEC. 2. Branches shall have such powers and privileges, and be subject to such obligations, as shall be determined upon from time to time by the National Association in annual meeting.

GOVERNMENT.

SEC. 3. Each branch shall be free to hold meetings and to govern itself as its members shall think fit, but no branch law shall be valid which, in the opinion of the National Association, may contravene any fundamental law of the Association.

EXPENSES.

SEC. 4. Each branch shall pay its own expenses, and no branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

PROCEEDINGS.

SEC. 5. Each branch shall furnish a copy of its proceedings, including papers and discussions, for publication with the Transactions of the National Association.

DELEGATES.

SEC. 6. Each branch may receive delegates from societies within its division upon the same conditions as the National Association, and which shall have the same standing in the National Association as though admitted directly from the State societies.

DUES.

SEC. 7. The annual dues of members attending the branches shall be paid to the branch treasurer. Two-fifths of the dues may be retained for the benefit of the branch. The remaining three-fifths shall be paid over to the Treasurer of the National Association.

SEC. 8. The annual meeting of any branch shall be omitted whenever the annual session of the National Association shall be held in its division.

RULES OF ORDER.

1. On the arrival of the hour of meeting, the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. No one shall be permitted to address the Association before giving his name and residence, which shall be distinctly announced from the chair; nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

4. At the request of any member a motion shall be put in writing.

5. At the request of five members a question shall be divided, or the yeas and nays ordered.

6. When a question is under debate no other motion shall be in order, except, first, to adjourn; second, to lay on the table; third, the previous question; fourth, to postpone; fifth, to commit; sixth, to amend; and these motions shall take precedence in the order here stated.

7. The previous question, and the motions to adjourn, to lay on the table, and to postpone shall be decided without debate.

8. A motion to adjourn shall always be in order, but no member can make such a motion while another is speaking or while a vote or ballot is being taken.

9. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

10. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Association.

11. No member shall interrupt another while speaking, except to raise a point of order.

12. When called to order, a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Association. If the point of order be sustained, the member can proceed in order by the consent of the Association.

13. Every member shall vote upon a question unless excused by the Association.

14. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

15. Any member who on a question voted in the majority may move a reconsideration of that question; but if that motion shall be lost or laid upon the table, it shall not be renewed without unanimous consent.

16. The President may vote with the members upon all questions, but having so voted shall not give the casting vote in case of a tie.

17. Motions for filling blanks shall be put in the order in which they are moved.

18. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

19. These rules may be suspended by unanimous consent.

ORDER OF BUSINESS.

1. Meeting of the Executive Committee, filling of vacancies therein, examination of credentials, and payment of dues, 8 A.M.

2. Meetings of the Sections at 10 A.M.

3. Organization of the Association at 11 A.M.

4. Calling the roll of qualified members.

5. Reading of the minutes, and action thereon.

6. Reports of officers, special committees, and miscellaneous business.

7. The reading and consideration of the stated annual reports from the Sections, together with volunteer papers upon the same subjects in their consecutive order.

In 1898,	commencing	with	Section	1
1899,	"	"	"	2
1900,	"	"	"	3
1901,	"	"	"	4

In 1902, commencing with.....Section 5
1903, " " ..... " 6
1904, " " ..... " 7
1905, " " ..... " 8
1906, " " ..... " 9
1907, " " ..... " 10
1908, " " ..... " 1

8. Report of Executive Committee.
9. Balloting for the place of next annual meeting.
10. Election of officers and three members of Executive Committee.
11. Instructions to the permanent committees.
12. Unfinished, new, and miscellaneous business.
13. Reading of minutes.
14. Installation of officers.
15. Final reading of minutes.
16. Adjournment.

AMENDMENTS.

The Constitution, Rules of Order, and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. *Resolved*, That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. *Resolved*, That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. *Resolved*, That it is unprofessional to use on cards or signs anything except name, title, and address.

4. *Resolved*, That this Association now in session direct that Sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics, or to give other exhibitions before this body.

5. *Resolved*, That two general addresses be delivered annually, on the second and third days' meetings, on some general topics of interest to the whole profession, the subjects to be selected by the third division of the Executive Committee, the first division of the Executive Committee to nominate the essayists annually.

6. *Resolved*, That a Standing Committee of three be appointed, to be known as the Committee on Terminology, whose duty it shall be to prepare

and submit a carefully prepared report at each annual meeting of this Association.

7. *Resolved*, That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

8. *Resolved*, That a committee of three be appointed by the chair to cooperate with the Army Medical Museum and Library managers in enriching its stores of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

9. *Resolved*, That the National Dental Association condemns the use of secret preparations known as "*local anesthetics*," as well as all other secret preparations.

10. *Resolved*, That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects of the papers read before them and digests of the same, and to send reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the chairman of the Section to which they belong.

11. *Resolved*, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

12. *Resolved*, That lists of the ex-Presidents of the American Dental Association and of the Southern Dental Association shall be published annually in the Transactions of the National Dental Association, and that all members and officers hold the same relation to the National Dental Association that they did to the former associations.

MEMBERS

OF THE

National Dental Association.

List of members as certified by the Treasurers of the American Dental Association and Southern Dental Association, in accordance with the resolution adopted at the first day's session, and which reads as follows:

Resolved, That the Treasurer of this Association be directed to request the Treasurers of the American Dental Association and of the Southern Dental Association to furnish him with the lists of the permanent members of their respective Associations, and he is hereby directed to add the names so furnished him to the Constitution of this Association as set forth in the provisions of membership in Article III, Section 5, of the Constitution; and be it further

Resolved, That said act of the Treasurer shall be legal and binding the same as if the signatures had been attached by the persons themselves.

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NATIONAL DENTAL ASSOCIATION.

SESSION OF 1898.

MINUTES OF TRANSACTIONS

OF THE

NATIONAL DENTAL ASSOCIATION,

SESSION OF 1898.

BY WM. ERNEST WALKER, ASST. REC. SECRETARY.

FIRST DAY—MORNING SESSION.

THE NATIONAL DENTAL ASSOCIATION commenced its first annual session in the Lecture Room of the Creighton Medical School, Omaha, Neb., at 11 A.M., Tuesday, August 30, 1898; the President, Dr. Thos. Fillebrown, in the chair.

Prayer was offered by Dr. J. Taft.

An address of welcome, tendering "the keys of the city," by the Mayor of the city, Hon. Frank N. Moores, was responded to by Dr. Jas. Truman.

On motion, roll-call and reading of the minutes were dispensed with, the minutes, as printed, being on motion accepted as correct.

The following members were found to be either present or to have forwarded their dues:

ADAIR, E. F.....Harmony Grove, Ga.
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Those marked * are permanent members of the Association without payment of dues, according to Standing Resolution No. 11.

Those marked † are permanent members of the Association without payment of dues, according to paragraphs 1 and 2, Sec. 5, Art. III, Constitution of the Southern Branch of the National Dental Association; Sec. 5, Art. III, Constitution of the National Dental Association, and Standing Resolution No. 12.

Those marked ‡ answered to roll-call.

Those marked *(d)* were delegates, but did not become permanent members.

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KEERANS, E. P.....Charlotte, N. C.
KELLS, C. EDMUND, JR.....124 Baronne st., New Orleans, La.
KETTIG, EDWARD M.....319 W. Walnut st., Louisville, Ky.
KING, A. B.....Baltimore, Md.
‡KING, H. T.....Fremont, Neb.
KIRK, EDWARD C.....Chestnut, cor. 12th st., Philadelphia, Pa.
KNAPP, J. ROLLO.....New Orleans, La.
†KNAPP, JAS. S.....New Orleans, La.
‡LEONARD, L. P.....Waseca, Minn.
LE ROY, LOUIS C.....6 Lexington ave., New York City.
LE SUEUR, W. N.....Austin, Texas.
‡LEWIS, WALTER F.....1155 Broadway, Oakland, Cal.
LIPPINCOTT, J. THOS.....1427 Walnut st., Philadelphia, Pa.
LITCH, W. F.....1507 Walnut st., Philadelphia, Pa.
‡LOETZERICH, JNO. D.....Pine Bluff, Ark.
†LOWRANCE, H. A.....Athens, Ga.
LUCKEY, B. F.....182 Main st., Paterson, N. J
LUCKIE, R. K.....Holly Springs, Miss.
†MARSHALL, E. B.....Rome, Ga.
‡MARSHALL, J. S.....1013 Venetian Bldg., Chicago, Ill.
‡MARSHALL, M. C.....St. Louis, Mo.
MARTIN, W. T.....Yazoo City, Miss.
MCANNALLY, F. H.....Jasper, Ala.
†MCDONALD, R. A.....Griffin, Ga.

‡McFadden, H. B.....3505 Hamilton st., Philadelphia, Pa.
‡*McKellops, H. J.....3548 Lindell ave., St. Louis, Mo.
‡McLean, W. T.....Glenn Bldg.. Cincinnati, O.
McManus, Chas.....80 Pratt st., Hartford, Conn.
McManus, Henry.....80 Pratt st., Hartford, Conn.
McManus, James.....80 Pratt st., Hartford, Conn.
Melendy, A. R.....Deaderick Bldg., Knoxville, Tenn.
‡Menges, Theo.....Cor. Franklin and Madison sts., Chicago, Ill.
‡Merriman, A. F. Jr.....1003½ Broadway, Oakland, Cal.
‡Molyneaux, Grant.....Cor. 7th and Elm sts., Cincinnati, O.
‡Monfort, J. B.....Fairfield, Ia.
Moore, J. Hall.....104 N. 9th st., Richmond, Va.
Moore, T. T.....142 Main st., Columbia, S. C.
‡Morgan, Henry W.....211 N. High st., Nashville, Tenn.
*Morgan, W. H.....211 N. High st., Nashville, Tenn.
‡Murlless, Frederick T., Jr.....Windsor Locks, Conn.
‡*d*Nason, A. W.....446 Bee Bldg., Omaha, Neb.
‡Nason, Geo. S.....446 Bee Bldg., Omaha, Neb.
Nelson, J. J.....330 South 5th st., Philadelphia, Pa.
Noble, H. B.....1324 New York ave., Washington, D. C.
Noel, L. G.....Church st., Nashville, Tenn.
‡Nones, R. H.....1708 Chestnut st., Philadelphia, Pa.
Northrop, A. L.....57 West 49th st., New York City.
Oeland, Jno. C.....Spartanburg, S. C.
Ottofy, Louis.....87 Maun st., Yokohama, Japan.
Ottolengui, R.....115 Madison ave., New York City.
‡Owen, E. B.....Brodhead, Wis.
Page, W. E.....16 Arlington ave., Boston, Mass.
*Palmer, Corydon.....Warren, O.
Palmer, S. B.....Syracuse, N. Y.
Parr, H. A.....New York City.
‡Patterson, J. D.....Keith and Perry Bldg., Kansas City, Mo.
Pearson, A. A.....Montgomery, Ala.
Peck, A. H.....Stewart Bldg., Chicago, Ill.
‡Peirce, C. N.....1415 Walnut st., Philadelphia, Pa.
Perry, S. G.....46 West 37th st., New York City.
‡Pfeifer, Josephine D.....1003 Masonic Temple, Chicago, Ill.
Pressey, B. J.....Citizens' and Marine Bank Bldg., Newport News, Va.
Price, W. A.....2238 Euclid ave.. Cleveland, O.
‡Prosser, A. J.....3901 Westminster Place, St. Louis, Mo.
Pruyn, C. P.....Room 1312, 100 State st., Chicago, Ill.
Quattlebaum, B. J.....Winnsboro, S. C.
Quattlebaum, E. G.....Columbia, S. C.
Quattlebaum, J. M.....Columbia, S. C.
†Rambo, Samuel.....Montgomery, Ala.

‡REAVIS, J. L.....LaGrande, Ore.
‡REED, J. H.....Lancaster, Wis.
REITZ, R. B.....244 E. 50th st., New York City.
REMINGTON, F. A.....57 W. 59th st., New York City.
RENALDO, W. R.....Fort Royce, Va.
RENOLDS, W. L.....Ft. Royal, Va.
RHEIN, MEYER L.....38 E. 61st st., New York City.
RICHARDS, W. H.....421½ W. Clinch st., Knoxville, Tenn.
‡RICHTER, R. G.....128 Wisconsin st., Milwaukee, Wis.
ROBERTS, N. J.....Waukegan, Ill.
ROHLAND, C. B.....123 Third st., Alton, Ill.
RUSH, R. A.....Mobile, Ala.
RUTLEDGE, B.....Lock Box 45, Florence, S. C.
SARRAZIN, J. J.....828 Canal st., New Orleans, La.
SEALS, R. D.....Fort Smith, Ark.
SEIP, H. S.....Allentown, Pa.
SHARP, S. P.....Deadrick Bldg., Knoxville, Tenn.
SHEPARD, L. D.....330 Dartmouth st., Boston, Mass.
‡SHRIVER, H. W.....15th and Farnam sts., Omaha, Neb.
SHRYOCK, WM. W.....27 W. Berry st., Ft. Wayne, Ind.
SIBLEY, A. H.....1214 Filbert st., Philadelphia, Pa.
SILL, CHAS.....301 W. 12th st., New York City.
SIMPSON, I.....Rock Hill, S. C.
‡SITHERWOOD, G. D.....118 W. Washington st., Bloomington, Ill.
‡SMITH, B. HOLLY.....Baltimore, Md.
SMITH, C. H.....Chattanooga, Tenn.
‡SMITH, CHAS. E.....Dodge, cor. 16th st., Omaha, Neb.
‡SMITH, EUGENE H.....383 Dartmouth st., Boston, Mass.
‡SMITH, H. A.....116 Garfield Place, Cincinnati, O.
SMITH, H. T.....116 Garfield Place, Cincinnati, O.
SMITH, J. W.....Baltimore, Md.
SMITH, L. A.....Port Gibson, Miss.
‡SMITH, M. C.....Room 3, Lee Hall, Lynn, Mass.
SMITH, W. SCOTT.....227 W. Chestnut st., Louisville, Ky.
STAPLES, GEO. S.....Sherman, Texas.
STARR, A R.....8 E. 92d st., New York City.
STEPHAN, JNO. F.....29 Euclid ave., Cleveland, O.
‡STEVENS, B. Q.....Cor. Main and Broadway, Hannibal, Mo.
STOCKTON, C. S.....17 W. Park st., Newark, N. J.
STRAIGHT, MILTON B.....80 W. Huron st., Buffalo, N. Y.
SUTPHEN, H. S.....24 E. Kinney st., Newark, N. J.
‡*TAFT, J.....Berkshire Bldg., Cincinnati, O
TALBOTT, ROBT. W.....1111 F st., Washington, D. C.
TEAGUE, B. H.....Aiken, S. C.
‡TEMPLETON, J. G.....435 Pennsylvania ave., Pittsburg, Pa.

*THACKSTON, W. W. H.....Farmville, Va.
THOMAS, J. D.....1112 Walnut st., Philadelphia, Pa.
‡THOMPSON, A. H.....Topeka, Kan.
‡THOMPSON, HENRY C.....113 Pennsylvania ave., Washington, D. C.
†TIGNER, J. A.....Rome, Ga.
‡TILESTON, H. B.....New Equitable Bldg., Louisville, Ky.
‡TRUMAN, JAS.....4505 Chester ave., W. Philadelphia, Pa.
TURNER, V. E.....107½ Fayetteville st., Raleigh, N. C.
VANVLECK, CHAS. K.....536 Warren st., Hudson, N. Y.
WALKER, R. H.....231 Main st., Norfolk, Va.
‡WALKER, WM. ERNEST.....Box 51, Pass Christian, Miss.
WALKER, W. W.....58 W. 50th st., New York City.
WASSALL, J. W.....711 Stewart Bldg., Chicago, Ill.
‡WATKINS, S. C. G.....Montclair, N. J.
‡WEEKS, THOS. E.....Dayton Bldg., Minneapolis, Minn.
WENDEL, W. C.....708 Goldsmith Bldg., Milwaukee, Wis.
WEST, THOS. C.....Natchez, Miss.
WESTERFIELD, T. L.....232 Main st., Dallas, Texas.
WHITBY, T. P.....Vaughn Bldg., Selma, Ala.
WHITE, GORDON.....Church st., Nashville, Tenn.
‡WHITSLAR, W. H.....29 Euclid ave., Cleveland, O.
WILLIAMS, JACOB L.....4 Walnut st., Boston, Mass.
WILSON, F. C.....12 Jones st., Savannah, Ga.
‡WILSON, P. J.....44 Nassau st., Princeton, N. J.
WOLF, J. L.....Washington, D. C.
WOOD, F. L.....Roanoke, Va.
‡WRIGHT, B. E.....Dekum Bldg., Portland, Ore.
WRIGHT, G. F. S.....Georgetown, S. C.
‡WRIGHT, P. H.....Oxford, Miss.
WYATT, T. M.....Bentonville, Ark.
YOUNG, R. C.....Anniston, Ala.
YOUNGER, W. J.....Auditorium Hotel, Chicago, Ill.

Any inaccuracies in the above list in name or location should be reported to the Treasurer at once, in order that the necessary corrections may be made.

Annual dues being payable in advance, no name appears on the above list except of those who have paid for 1898, and the Transactions are not sent to any who have not fully paid their dues.

Dues must be paid to the Treasurer. Send Draft, P. O. order, or Express order.

HENRY W. MORGAN,
211 North High st., Nashville, Tenn.

Dr. J. N. Crouse, Chairman of the Executive Committee, made a verbal report, and offered a printed program, which was adopted.

The report of the Recording Secretary was read, as follows:

RECORDING SECRETARY'S REPORT.

Your Secretary, at the advice of the President, had forwarded to all members the Transactions of the organization and first meeting, as ordered printed in the Transactions of the American Dental Association.

Receipts and expenditures:

Received from Treasurer.....$22 25
Expended for printing, expressage, postage, and stationery..... 22 25

CHICAGO, April 5, 1898. GEO. H. CUSHING, *Secretary.*

The report was received and approved.

On motion, Dr. C. N. Peirce was made a committee of one to convey to Dr. Cushing a telegraphic message expressive of regrets for his absence from the present meeting.

The Treasurer submitted the following report, which was referred to the Auditing Committee:

TREASURER'S REPORT.

OMAHA, Neb., August 30, 1898.

To the National Dental Association, Dr.

Received from Treasurer S. D. A., 147 names transferred.....		$147 00
" " " " Dues 1898, 83 members.....		249 00
" " " A. D. A., 234 names transferred.....		234 00
		$630 00
Cr.		
Printing Constitution.....	$19 00	
Expenses Secretary.....	22 25	41 25
		$588 75

Membership:

S. D. A.....	147	
A. D. A.....	234	
	381	
Less	26	(duplicate names.)
	355	
Plus	2	added at St. Augustine.
	357	total membership.

Respectfully submitted,

HENRY W. MORGAN, *Treasurer.*

Examined and found correct:

V. H. JACKSON,
J. D. PATTERSON,
M. F. FINLEY, *Auditing Committee.*

The Corresponding Secretary's report was next read, and referred to the Auditing Committee:

REPORT OF CORRESPONDING SECRETARY.

Mr. President and Members of the National Dental Association:

As your Corresponding Secretary, I have attended to the correspondence of the Association during the past year according to the best of my ability, and have sent the necessary notices to the State societies and journals, as directed by the President.

It would greatly aid the Corresponding Secretary of this Association if each society entitled to representation herein would send a full list of its officers, immediately after each annual meeting, to the Secretary of this body.

By order of the President, the set of charts belonging to the American Dental Association, made by the late Dr. J. J. R. Patrick, of Belleville, Ill., illustrative of pre-historic crania, has been forwarded to the U. S. Army Medical Museum and Library, to be preserved with the other papers and records of the Association already deposited there.

My expenditures during the year have been as follows:

To printing circulars and envelopes	$4 50
" " blank certificates for delegates	2 75
" postage	5 00
	$12 25

Respectfully submitted,

EMMA EAMES CHASE,
Corresponding Secretary.

OMAHA, NEB., August 30, 1898.

The following communication from the Washington City Dental Society was read:

At the regular monthly meeting of the Washington City Dental Society, held on June 21, 1898, by a vote of the Society (one dissenting) the name of Dr. John B. Rich was stricken from the honorary roll of members.

R. C. TALLBOTT, *Secretary.*

On motion, Section 6, Article V, of the Constitution was ordered enforced; the name of Dr. J. B. Rich was therefore dropped from the roll of membership of this body.

The following communication was read by the Secretary:

To the President and Members of the National Dental Association:

GENTLEMEN,—At the tenth annual meeting of the Northern Illinois Dental Society, held at Rockford, Ill., October 20 and 21, 1897, the undersigned were appointed a committee to draft and present to your Association suitable resolutions, with a view to remedy an existing evil regarding the

interstate practice of dentistry; and we herewith submit the following for your consideration:

WHEREAS, A legal practitioner of any one of the United States, who desires to remove to another State, is, under the existing laws, compelled to comply with certain requirements of the dental law of that State; and

WHEREAS, In many instances, such legal practitioner (sometimes of many years' experience) is subjected to a more or less severe theoretical examination, which cannot even be successfully passed by many who are fresh from the college halls; therefore, be it

Resolved, That the National Dental Association be and is hereby requested to secure such modification of the dental laws of the various States as, under reasonable restrictions, will enable competent practitioners to remove from one State to another without being compelled to submit to provisions which are eminently unfair to a large number of capable dentists.

LOUIS OTTOFY,
W. H. TAGGART,
M. L. HANAFORD,
Committee.

Attest: JAMES W. CORMANY, *Secretary.*
MOUNT CARROLL, ILL., November 10, 1897.

On motion of Dr. A. W. Harlan, the communication was referred to Section II.

Reports from several State societies, rendered in accordance with Standing Resolution X, presented by Dr. Wm. Ernest Walker, were referred to a special committee, subsequently appointed as follows: Thos. E. Weeks, J. Y. Crawford, P. H. Wright.

The Executive Committee reported that certain State societies had, in electing delegates, ignored Section 4 of Article IV of the Constitution, and asked for instructions.

On motion of Dr. S. W. Foster, it was unanimously resolved that the rule be enforced in all cases.

It was therefore ruled that delegates, elected by State societies, but who are not graduates from some reputable dental or medical college, or who did not enter the profession previous to 1875, are not eligible to membership in this Association.

Discussed by Drs. Crouse, Patterson, Barrett, Taft, Walker, and Foster.

The following resolution, offered by Dr. G. V. I. Brown, was unanimously adopted:

Resolved, That delegates who are present, but have been ruled out through the enforcement of Section 4 of Article IV of the Constitution, be given the privileges of the floor during this meeting.

The Executive Committee announced the appointment of Drs. Frank Holland and G. V. I. Brown to fill vacancies on the Executive Committee.

The following communication from Dr. R. Ottolengui was read, and, on motion, referred to the Executive Committee:

To the President and Members of the National Dental Association:

GENTLEMEN,—At the annual meeting of the New York State Dental Society in May, 1897, I was appointed a committee of one to arrange for a petition to Congress, for the passage of an act restraining the granting of dental patents of a nature objectionable to the members of our profession.

I placed myself in communication with the officers of all the State societies throughout the country, and the movement was met with practically unanimous approval. I then had circulated blank petitions for the signatures of individual dentists, with the result that I have the signatures of three thousand of our *confrères*, which represents a very large percentage of the membership in dental societies throughout the country, and consequently we may claim to have the entire approval of the students of our profession.

An attorney was engaged to represent us in Washington and to draw up a bill, which has been introduced in both branches of Congress, and in both cases referred to the proper committees. I, personally, visited Washington and was given a hearing by the Patent Committee of the Senate, with the result that I am in a position to state that a favorable report may be expected from this Committee during the next session of the present Congress.

The bill reached the House Committee only a short time before adjournment and when the country was busy with war measures, and we were advised by members of the Committee not to insist upon a hearing at that time. Our counsel, however, presented our arguments to the Chairman of the House Committee, and I feel safe in saying that this Committee also can be influenced to give a favorable report in the House.

Thus, the present status is that this much-needed legislation is almost within our grasp. All that seems requisite will be that, when Congress meets again, it shall be made possible to prove to these two Committees that the movement is really demanded by the better element of the dental world, and nothing could tend better to this end than definite action by our National Association.

In the interest, therefore, of the New York State Society (which I represent officially), and of all the other State societies who have tendered me their support, I respectfully request that a resolution shall be passed

by the National Association, urging the necessity and justice of the proposed legislation, and requesting Congress to hasten the passage of the pending bill.

I do not believe that a special committee will be required, provided I could be furnished with an official copy of such resolutions to present to the two Patent Committees. However, it might perhaps be a wise course for the National body to appoint a special committee, and, if so, I should recommend that such a committee should consist of only one person, and that person one who could reach the capital on very short notice, as my experience has been that notification by a Congressional Committee that a hearing can be granted on a certain day might be received barely in time to reach Washington.

I should perhaps also touch upon the financial aspect of this undertaking.

I shall eventually render to the New York State Society, and through them to the dental world, a detailed accounting of the receipts and expenditures, but at the present time it will suffice to state that the following donations to the fund have been received:

New York State Society, $50.00; Illinois State Society, $50.00; Pennsylvania State Society, $25.00; Central Dental Association of Northern New Jersey, $25.00; Indiana State Dental Society, $15.00; Minnesota State Dental Association, $10.00; a total of $175.00, whereas the expenditures up to date have been somewhere in the neighborhood of $300.00.

It will be almost absolutely necessary to retain the attorney during the next session of Congress, and consequently it is evident that more money will be required. If the National Association could make a subscription to this fund, I venture a belief that it would do much to encourage other State societies to make contributions, and also would tend to impress upon Congress the fact that the approval of the National body is not merely sentimental.

Very respectfully,

R. OTTOLENGUI, *Committee N. Y. State Society.*

On motion, further consideration of miscellaneous business was deferred, and the Vice-President from the South, Dr. B. Holly Smith, took the chair, while the President read his annual address.

On motion of Dr. H. A. Smith, amended by Dr. A. H. Thompson, the address was referred to the following committee, composed of one member from each of the three divisions: Dr. H. A. Smith, from the East; Dr. Frank Holland, from the South; Dr. C. L. Goddard, from the West.

On motion, the report of the committee was made the special order of business for 10 A.M. Wednesday.

On motion, adjourned to 7.30 P.M.

FIRST DAY—EVENING SESSION.

The Association was called to order by the President at 7.45 P.M.

The minutes of the morning session were read and approved.

There being no miscellaneous business, the following Committees were called, and, not being ready to report, were granted further time:

Committee on Journal; Committee on History; Committee on National Museum and Library; Committee on State and Local Societies; Committee on Necrology.

Dr. Molyneaux, Chairman of the Committee on Terminology, stated that the function of the Committee was not clearly understood, and asked permission to report through Section II, which was granted.

The Committee of "one member from each State and Territory," appointed to work in the interests of the Dental Protective Association, reported no organization.

The proposed amendments to the Constitution, laid over from last year, were taken up and acted upon, as follows:

By Dr. J. Y. Crawford: To change the name of this Association from The National Dental Association to The American Association of Dental Surgeons; on motion of Dr. A. H. Thompson, laid on the table.

By Dr. S. H. Guilford: To change the name from that of National Dental Association to that of The American Association of Dental Science; on motion of Dr. C. N. Peirce, laid on the table.

By Dr. Stellwagen: To amend Article I by striking out the words "National Dental" and inserting in their place the words "American Stomatological;" on motion of Dr. J. N. Crouse, laid on the table.

On motion, the following committee was appointed to examine into and report upon the affairs of the Dental Protective Association: Drs. G. V. I. Brown, J. Y. Crawford, C. S. Butler.

The Committee on National Dental Museum and Library presented their report, with accompanying exhibits, A and B.

OMAHA, NEB., August 31, 1898.

To the National Dental Association:

GENTLEMEN,—Your Committee on National Museum and Library beg to report that it met in Washington immediately after adjournment of the National Dental Association last August, and visited this institution, was cordially received, and found the officials interested in the work. They expressed their willingness to do their utmost to build up the dental section.

The work of accumulating specimens that has been done is highly creditable, and the display cases must attract the attention of those visiting the Museum. Those who have contributed are given credit by name on the label accompanying their contribution.

The Library contains the best and most complete collection of dental works and dental literature in the world, and in its volume and completeness was most gratifying to your Committee. There are some journals and society transactions needed to complete the files, a list of which was published by Dr. Merrill, in charge of Library, in the *Dental Cosmos* in November and December, 1897.

We learned that any book may be obtained through any public library, or on the deposit of a sum of money equal to its value, for two weeks' use by any dentist. The working value of the Library is greatly enhanced by this liberal offer of the use of this great Library.

There are a few of the profession and a few medical men who appreciate this great work, but there are many who have no idea of its importance in elevating dentistry in the estimation of scientific men.

Your Committee, under your instructions given in 1897, secured the recommendation of Surgeon-General George M. Sternberg, indorsed by the Secretary of War, for the employment of a Dental Pathologist at a salary of $2000.00. (See Exhibit A.) It passed the Senate and failed in Committee of Conference.

A letter under date of August 22, from Surgeon-General Sternberg, assures your Committee that he will renew his recommendation for the employment of a dental pathologist in the estimates for his office, to be submitted to Congress at its next session. (See Exhibit B.)

During the year one of our dental journals, after a visit to the Museum and Library by the editor, took up the work and has secured from its readers contributions of a number of valuable specimens. Other journals have promised to render like valuable assistance to your Committee.

Respectfully submitted,

WMS. DONNALLY, *Chairman*,
THOMAS FILLEBROWN,
HENRY W. MORGAN.

EXHIBIT A.

55th Congress, 2d Session.—House of Representatives.—Document No. 210.

DENTAL PATHOLOGIST.

Letter from the Secretary of the Treasury, transmitting a copy of a communication from the Secretary of War, submitting an estimate of appropriation under the head of "Salaries, Office of Surgeon-General," for one dental pathologist.

JANUARY 11, 1898.—Referred to the Committee on Military Affairs and ordered to be printed.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., January 10, 1898.

SIR: I have the honor to transmit herewith, for the consideration of Congress, copy of a communication from the Secretary of War, of the 8th instant, submitting an estimate of appropriation under the head of "Salaries, Office of Surgeon-General," for the fiscal year ending June 30, 1899, for one dental pathologist, at $2000 per annum.

Respectfully yours,

L. J. GAGE, *Secretary.*

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

WAR DEPARTMENT,
Washington City, January 8, 1898.

SIR: I have the honor to forward herewith, for transmitting to Congress, an estimate ($2000) of appropriation for "Salaries, Office of Surgeon-General," required for the use of the War Department for the service of the fiscal year ending June 30, 1899.

Very respectfully,

G. D. MEIKLEJOHN,
Acting Secretary of War.

THE SECRETARY OF THE TREASURY.

WAR DEPARTMENT,
SURGEON-GENERAL'S OFFICE,
Washington, January 7, 1898.

SIR: In compliance with your indorsement of the 6th instant, I have the honor to submit the inclosed estimate for one dental pathologist to the Army Medical Museum, and invite your attention to the note of explanation relative thereto.

Very respectfully,

GEO. M. STERNBERG,
Surgeon-General United States Army.

THE ACTING SECRETARY OF WAR.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1899, by the Office of the Surgeon-General of the Army.

OFFICE OF SURGEON-GENERAL.

Salaries, Office of Surgeon-General:
One dental pathologist (submitted).....$2000

NOTE.—The thirty-fifth annual meeting of the American Dental Association, in line with other national associations of specialists, adopted a resolution formally recognizing the library of the Surgeon-General's Office and the Army Medical Museum as the national museum and library of the dental profession of the United States, and appointed a committee to cooperate with the officer in charge of the museum and library in enriching its stores of dental literature and museum specimens. This resolution making the library of the Surgeon-General's Office and the Army Medical Museum the place of deposit of contributions from the dental profession

of the country was favorably considered, and a department of normal and morbid anatomy and physiology of the teeth has been organized. Quite a number of valuable and interesting contributions have already been made to the museum, and the library has been increased by donations of books, essays, and journal literature pertaining to the subject of dentistry. Through the chairman of the Committee of the American Dental Association having this matter in charge, I am informed that it is the wish of the Association to have attached to the Army Medical Museum a specialist, well versed in the anatomy, physiology, and pathology of the teeth, who shall receive, prepare, and properly place on exhibition such specimens of morbid and normal anatomy and pathology pertaining to the oral cavity as may be contributed to the museum, and who may also be charged with the preparation of models and apparatus used in mechanical dentistry, for the purpose of illustrating surgical and dental procedure in treatment of deformities and diseases of the mouth and teeth. That such an appointment would be of the greatest value to the dental profession and to the general public is beyond question, and it would do much to place the profession of dentistry fully within the line of attainments and advancement of the general science of modern medicine and surgery by the exact determination of the anatomy, histology, pathology, physics, and dynamics of so important a part of the human system as the mouth and teeth, as well as affording a ready and most valuable means of instruction to the dental profession, to teachers, students, and investigators. I would respectfully state that I am heartily in accord with this desire of the American Dental Association, and strongly recommend that an annual appropriation be made, not to exceed $2000, to procure the services of a competent specialist, well versed in the anatomy, physiology, and pathology of the teeth, to be designated as dental pathologist to the Army Medical Museum.—*Geo. M. Sternberg, Surgeon-General United States Army.*

EXHIBIT B.

Subject: Dental Pathologist. In reply refer to No. 2486.

WAR DEPARTMENT,
SURGEON GENERAL'S OFFICE,
Washington, August 22, 1898.

WMS. DONNALLY, D.D.S., 1022 FOURTEENTH STREET, N. W., WASHINGTON, D. C.

SIR: In reply to your letter of the 19th instant, I have to inform you that you have permission to report to the meeting of the National Dental Association, soon to be held in the city of Omaha, that I shall renew my recommendation for the employment of a dental pathologist for the Army Medical Museum in the estimates of this office, to be submitted to Congress at its next session.

Very respectfully,
GEO. M. STERNBERG,
Surgeon-General U. S. Army.

The report was accepted and ordered placed on file for publication in the Transactions.

The Chairman of the Executive Committee presented the following preamble and resolution as the unanimous report from that Committee on the communication from Dr. Ottolengui, relative to patent-law amendments:

WHEREAS, The Supreme Court having already declared all such patents as are contemplated in this move to amend the patent law invalid, which makes all such amendments unnecessary; and

WHEREAS, The constant agitation of this question is detrimental to the best interests of organizations now in existence; be it

Resolved, That the National Dental Association, now in session, disapproves of any work in this direction, and recommends that the whole question be dropped as unwise and unnecessary.

The resolution, as read, was unanimously adopted by the Association.

The Committee on Credentials made a partial report, which was subsequently completed, as follows:

REPORT OF COMMITTEE ON CREDENTIALS.

California State Dental Association—W. F. Lewis, J. L. Asay, A. F. Merriman, Jr.

Dental Society of the State of New York—F. LeGrand Ames (1875).

Illinois State Dental Society—H. J. Goslee, G. D. Sitherwood.

Indiana State Dental Association—Junius E. Cravens, M. F. Ault, Alex. Jameson.

Iowa State Dental Society—W. R. Clack (1874), T. L. James, W. H. DeFord, J. B. Monfort.

Kansas State Dental Association—C. E. Esterly, A. H. Thompson.

Kentucky State Dental Association—W. E. Grant, H. B. Tileston.

Maryland State Dental Association—J. W. Smith, M. W. Foster.

Michigan Dental Association—M. G. Hilman.

Minnesota State Dental Association—J. R. Conway, Thos. E. Weeks, G. V. I. Brown, L. P. Leonard.

Mississippi Dental Association—P. H. Wright.

Missouri State Dental Association—Chas. L. Hungerford.

Nebraska State Dental Society—H. W. Shriver, H. T. King, A. W. Nason, Chas. E. Smith, W. N. Dorward.

North Carolina State Dental Society—Jas. F. Griffith.

Oregon State Dental Association—B. E. Wright, J. L. Reavis.

Pennsylvania State Dental Society—C. N. Peirce, Robt. H. Nones, L. Greenbaum, J. G. Templeton, H. B. McFadden.

Washington City Dental Society—W. N. Cogan, M. F. Finley, Williams Donnally.

Washington State Dental Society—W. E. Burkhart (1875).

Wisconsin State Dental Society—J. H. Reed, E. B. Owen, R. G. Richter.

Dr. C. L. Goddard reported the appointment, in California, of a Dental Surgeon, with two assistants, in the Volunteer Army.

Dr. C. S. Butler offered the following resolutions:

Resolved, That this Association approves and indorses the movement for the appointment of dentists in the army.

Resolved, That a committee of five be appointed by the President to represent this Association in procuring the necessary legislation.

On motion of Dr. Barrett, the resolutions were referred to the Executive Committee, with instructions to report before final adjournment of this meeting.

On motion of Dr. C. N. Peirce, Dr. Goddard was requested to furnish the Secretary with such further details as he may be able to obtain, the same to be published in the Transactions.

The subject was discussed by Drs. J. S. Marshall, Butler, Donnally, Barrett, Leonard, Brophy, and Goddard.

There being no further miscellaneous business, Section I was called.

Dr. Molyneaux, Chairman, read his report and offered one paper by Dr. L. E. Custer.

Dr. Custer then read his paper, entitled "The Improved Electric Oven and the Means of Determining the Heat in Fusing Porcelain."

Discussed by Drs. H. A. Smith, Tileston, Molyneaux, and closed by Dr. Custer.

The Secretary read a communication from the local committee of The Knights of Ak-sar-ben, tendering an invitation to visit The Den Wednesday, August 31, at 8.30 P.M.

On motion of Dr. Patterson, the invitation was accepted, with the thanks of the Association.

Dr. A. W. Harlan read the following preamble and resolutions, which were adopted unanimously:

WHEREAS, It is well known that an International Exposition will be held in Paris; and

WHEREAS, Provision has been made for the holding of an International Dental Congress in Paris, and Committees have already been appointed to organize such a Congress, and that it is the wish of said Committees that the National Association appoint a Committee to co-operate with those Committees in making the Congress a success; therefore, be it

Resolved, That a General Committee of Fifteen be appointed by the President, to co-operate with the General Committee in Paris.

Such Committee to have power to add to its number, not to exceed twenty-five names in the United States; and that said Committee, when organized, be empowered to adopt such rules and regulations as will insure the success of the Congress. The present President and Vice-Presidents of this body shall be members of this Committee. After this Committee has organized, its acts shall be final; and after the close of the Congress, said Committee shall present a report of its work to this Association.

Committee of the International Dental Congress, Paris:

A. W. Harlan, Chicago, Ill.
A. H. Fuller, St. Louis, Mo.
H. J. McKellops, St. Louis, Mo.
J. Taft, Cincinnati, Ohio.
H. A. Smith, Cincinnati, Ohio.
W. W. Walker, New York, N. Y.
W. C. Barrett, Buffalo, N. Y.
T. W. Brophy, Chicago, Ill.
W. E. Griswold, Denver, Col.
C. L. Goddard, San Francisco, Cal.
H. W. Morgan, Nashville, Tenn.
Frank Holland, Atlanta, Ga.
E. C. Kirk, Philadelphia, Pa.
J. D. Patterson, Kansas City, Mo.
Thos. E. Weeks, Minneapolis, Minn.
Thos. Fillebrown, Boston, Mass., President N. D. A., 1898.
Jas. McManus, Hartford, Conn., Vice-Pres., East.
B. Holly Smith, Baltimore, Md., Vice-Pres., South.
L. L. Dunbar, San Francisco, Cal., Vice-Pres., West.

On motion, adjourned to 9 A.M. Wednesday.

SECOND DAY—MORNING SESSION.

The Association was called to order by the President at 9.45 A.M.

The minutes of the preceding session were read and approved.

Dr. M. F. Finley offered the following amendments to the Constitution, which, under the rules, lie over for action at a later session of this meeting:

Amend Section 1, Article IV, by inserting after the first word, third line: "and the Societies bearing the names of the Territories enumerated in Section 3, Article XII."

Amend Section 3, Article III, by inserting after the first word, third line: "and Territorial."

The Secretary read the following communication from the President of the Southern Branch of the Association:

To the President and Members of the National Dental Association:

I beg to report that the minutes and transactions of the meeting of the Southern Branch of this Association, held in St. Augustine, Fla., in February last, were placed in the hands of the Publication Committee, to be edited and transferred to the Publication Committee of this body. I learn from the Chairman of the Committee that they are not in shape to be presented at this time, but will be turned over at an early date.

Respectfully submitted,

WM. ERNEST WALKER, *President Southern Branch N. D. A.*

The communication was referred to the Publication Committee.

Dr. J. Taft, Chairman of the Committee on State and Local Societies, made a partial verbal report. He stated that some progress had been made, but nothing that could constitute a formal report, which he asked to defer till the next annual meeting; this was granted.

Dr. Walker, as a Committee of One, appointed by the Southern Branch, offered the following report:

Mr. President, Ladies, and Members of the National Dental Association:

At the annual meeting of the Southern Branch of this Association, held at St. Augustine, Fla., in February last, I had the honor of being appointed "a committee of one" to bring before this body the subject of a mortuary tribute to the memory of the man whom, above all others, the dental profession should delight to honor; the man who founded the first dental college in the world; who edited the first dental journal in the world; who was the author of standard works on dental science known the world over,—a man whose remains lie in a lonely grave in Mt. Olivet Cemetery, near Baltimore, with nothing to distinguish it from those of "the common herd" around it.

Need I say that I speak of Chapin A. Harris?

It were a tedious task to even enumerate the unsuccessful efforts heretofore made in this direction. Committees have been appointed by National, State, and Local societies; subscription lists have been started, with treasurers duly appointed; funds, small in amount, perhaps, individually, but probably of considerable value in the aggregate if consolidated, are doubtless awaiting concerted action.

What more fitting time and opportunity to inaugurate a movement for the commemoration of the name of Chapin A. Harris than right now,

and right here, at this, the first meeting of this great National Dental Association,—an Association broader in its scope, higher in its aims, more far-reaching in its influence, than any Association the world has ever known; yet an Association which owes its very existence to the life and work of Chapin A. Harris.

In the homely but emphatic words of Dr. J. Y. Crawford,—words spoken when this subject was before the Southern Branch last spring,—

"Let us get a move on us, and make it a success!"

Respectfully submitted,

WM. ERNEST WALKER, *Committee S. Br. N. D. A.*

The hour for the special order of business having arrived, on motion, the report lies over, subject to be called up later.

The Vice-President, Dr. B. Holly Smith, took the chair and called for the report of the Committee on the President's address.

The report was read by Dr. H. A. Smith.

The recommendations of the Committee were accepted without discussion, and embodied in the following motions:

Dr. Guilford moved the adoption of the recommendation that a Code of Ethics be adopted. Carried.

Dr. Taft moved the appointment of a committee of three to draft a Code of Ethics. Carried.

The Chair appointed as the committee, Dr. H. A. Smith (who was associated with Dr. Geo. Watt in the formulation of the Code by which the American Dental Association was governed for so many years), with Drs. Frank Holland and H. W. Morgan.

Dr. H. W. Morgan offered the following amendments to the Constitution, embodying the recommendations of the President, indorsed by the Committee:

PROPOSED AMENDMENTS TO THE CONSTITUTION.

Article VI shall be amended so as to read: "After 1898 the President shall be chosen from the division in which the next annual meeting is to be held."

In Article IV, Section 1, the word "ten" shall be changed so as to read "six."

Article III, Section 3, shall be changed so as to read as follows: "They shall be chosen in any manner their Association may see proper."

On motion, the amendments were made the special order of business for 10 A.M. Thursday.

Dr. J. S. Marshall, Chairman of the Committee on Journal, offered the following report:

REPORT OF COMMITTEE ON JOURNAL.

To the President and Members of the National Dental Association:

Your Committee appointed to take into consideration the establishment of a journal devoted to the interests of this Association would say that we have given the subject some consideration, and have looked into the details involved in such an enterprise, and we fully believe that if properly carried out it would be of great value to this organization and the profession in general. It would be a stimulus which would greatly promote rapid growth of the Association, and add greatly to its success and usefulness. We have given considerable thought to the financial aspect of the matter and to the probabilities of making the journal a successful enterprise. We fully believe that it would be well sustained by contribution from the treasury of this Association, and would be a vehicle through which the papers and proceedings of the various State and Branch Associations would find ready access to the members of the dental profession of the civilized world.

Your Committee have in mind a scheme by which they think the work could be established and carried on. We are led to believe that the income from subscriptions and advertisements would not be sufficient to meet the expenses of the publication for the first two years. The deficiency, then, would devolve upon this Association. We have estimated that the expense of publication would be about three thousand dollars a year. To this should be added a sum for compensation for editorial work, which could probably be obtained, for the first two years, at one thousand dollars per annum.

We would suggest that an edition of three thousand copies be issued at the beginning; the subsequent increase to be regulated by the success of the journal.

The scheme which your Committee have in view has not yet been wrought out in all its details, and further time is required for its completion. We therefore ask that the Committee be continued until the next annual meeting of the Association.

JOHN S. MARSHALL, *Chairman.*
J. TAFT,
Committee.

On motion of Dr. H. W. Morgan, the report was accepted and referred to the Publication Committee, and the Committee on Journal continued for another year.

On motion of Dr. Crouse, it was ordered that the order of busi-

ness presented in the program for Thursday morning be suspended, and the selection of place of meeting and the election of officers be made the special order of business for 11 A.M. Thursday.

On motion of Dr. Guilford, it was resolved that adjournment of the present session be to 2 P.M. of this day.

Section II was called.

Dr. Guilford read the report, offering two papers on Nomenclature, by Wm. Ernest Walker,—(1) Cast and Model; (2) Articulation and Occlusion.

Dr. Walker then read his paper, entitled "Cast and Model."

The subject was discussed by Drs. Goddard, Guilford, Molyneaux, Barrett, and Weeks, and closed by Dr. Walker.

The paper was referred to the Publication Committee, and the recommendation embodied in the paper referred back to Section II for further consideration.

With the consent of the Section and of the Association, the second paper was withdrawn by the author.

On motion, Section II was passed.

Dr. J. S. Marshall announced that to-day (August 30) is the seventy-third birthday of the second oldest dentist present at this meeting—Dr. H. J. McKellops. On motion of Dr. Marshall, a rising vote of congratulations was tendered Dr. McKellops, which was greeted with warm applause and calls for a speech.

Dr. Crawford led Dr. McKellops to the platform and expressed his profound congratulations at the attainment of his seventy-third anniversary, addressing him as one of the first exponents in the world of modern dental surgery.

Dr. McKellops responded with great feeling.

Section III was called.

Dr. Frank Holland, Secretary, read the report, offering one paper by Dr. B. Holly Smith.

Dr. Smith then read his paper, entitled "Removal of the Dental Pulp."

The subject was discussed by Drs. Barrett, Hungerford, Patterson, V. H. Jackson, Taft, Watkins, Peirce, Hillman, and Crawford, and closed by Dr. B. Holly Smith.

On motion, Section III was passed.

Dr. Patterson reported an additional list of qualified delegates; the report was accepted.

The Special Committee appointed to examine the affairs of the Dental Protective Association reported as follows:

REPORT OF COMMITTEE ON DENTAL PROTECTIVE ASSOCIATION.

Your Committee appointed to examine the affairs of the Dental Protective Association would respectfully report as follows:

We have examined the books and accounts of said Association for the past year, commencing July 23, 1897, and ending August 24, 1898, and find them correct, and the affairs of the Association wisely and judiciously managed.

GEO. V. I. BROWN,
J. Y. CRAWFORD,
C. S. BUTLER,
Committee.

On motion, the report was adopted.

The Executive Committee reported the following preamble and resolution:

WHEREAS, The National Dental Association having appointed a committee to take charge of and have full control of the subject of legislation concerning the employment of dental surgeons in the army and navy;

Resolved, That this Association deprecates any independent action on the part of State and Local societies, or individuals, without the approval of said committee.

The resolution was adopted by the Association, and Drs. Finley, Donnally, and Butler appointed as a committee to report on the subject next year.

The hour for reorganization of Sections having arrived, after some discussion, it was ordered that the Sections stand as they are;

members to be apportioned after mail communication, as heretofore. The Sections were subsequently organized as follows:

SECTION I. Prosthetic Dentistry, Chemistry, and Metallurgy.—I. N. Broomell, chairman; Wm. Ernest Walker, secretary. Wm. Conrad, Robert Huey, W. Storer How, H. J. Goslee, J. L. Reavis, Robert H. Nones, Laurence Leonard, S. C. G. Watkins, T. C. West, Henry McManus, P. J. Wilson, Wm. S. Hosford, J. N. Van de Water, W. H. Fundenberg, Geo. Evans, J. Edwin Boozer, Grant Molyneaux, W. S. Smith, Louis C. LeRoy, Geo. M. Whitfield, D. D. Smith, J. Rollo Knapp, T. S. Waters, C. Edmund Kells, H. S. Sutphen, S. A. Freeman, J. A. Hall, N. D. Edmonds, Geo. W. Warren, E. G. Quattlebaum, Ralph B. Reitz, J. V. Haller, S. W. Allen, H. L. Ambler, L. Augspath, J. W. Ayers, Boyd H. Baker, L. L. Barber, U. D. Billmeyer, J. Adams Bishop, E. A. Bogue, H. H. Boswell, C. T. Brockett, D. E. Everitt, Geo. Eubank, W. H. Ewald, Geo. L. Field, J. G. Fife, W. B. Finney.

SECTION II. Dental Education, Literature, and Nomenclature.—S. H. Guilford, chairman; M. F. Finley, secretary. Theo. Menges, C. H. Frink, A. H. Thompson, Wm. E. Walker, M. F. Ault, Edmund Noyes, H. T. Smith, Jacob L. Williams, L. Ashley Faught, Chas. McManus, C. N. Peirce, J. Hall Moore, B. D. Brabson, R. A. Rush, Wm. E. Harper, Chas. J. Essig, Thos. E. Weeks, E. C. Kirk, Frank G. Gregory, Henry W. Morgan, J. Taft, Wm. A. Montell, F. T. Murlless, Jr., C. D. Cook, D. D. Smith, L. D. Shepard, A. O. Hunt, H. S. Sutphen, W. W. H. Thackston, H. H. Johnson, H. L. Ambler, L. L. Barber, J. Adams Bishop, E. A. Bogue, C. T. Brockett, A. J. Brown, H. J. Burkhart, C. S. Butler, Ellen R. Carr, I. N. Carr, C. S. Case, J. S. Cassidy, W. G. Chase, C. C. Chittenden, Dwight M. Clapp, W. R. Clifton, S. B. Cook, W. H. Cooke, L. M. Cowardin, T. E. Craddock, Wm. Crenshaw, J. N. Crouse, L. L. Dunbar, Geo. L. Field, W. H. Morgan.

SECTION III. Operative Dentistry.—J. Y. Crawford, chairman; Frank Holland, secretary. M. F. Ault, Alex. Jamison, Chas. H. Smith, A. F. Merriman, Jr., Edmund Noyes, Laurence Leonard, J. R. Conway, C. N. Johnson, Corydon Palmer, H. T. Smith, S. Freeman, S. G. Perry, J. I. Hart, L. C. Taylor, Harvey Iredell, E. S. Gaylord, S. C. G. Watkins, Jas. McManus, Henry Barnes, A. H. Fuller, G. W. Hoysradt, W. E. Page, Howard S. Seip, J. Hall Moore, P. J. Wilson, Wm. Conrad, S. B. Palmer, B. Eugene Holcombe, Thos. Fillebrown, S. E. Gilbert, W. F. Fundenberg, C. S. Stockton, H. A. Smith, J. N. Van de Water, Wm. E. Walker, L. G. Noel, T. T. Moore, E. T. Darby, Wm. E. Harper, T. M. Allen, J. J. Sarrazin, R. K. Luckie, Thos. E. Weeks, W. St. George Elliott, V. E. Turner, J. H. Benton, A. O. Ross, C. L. Alexander, A. J. Prosser, Louis C. LeRoy, Chas. K. Van Vleck, S. H. Guilford, Earl P. Hawes, H. B. Tileston, H. G. Ulrich, J. T. Lippincott, B. Holly Smith, R. J. Hart, B. H. Baker, Louis Jack, B. F. Luckey, D. D. Smith, G. L. S. Jameson, J. W. Meng, T. S. Waters, C. H. Harroun, S. L. Goldsmith, H. S. Sutphen, Robt. I. Verplanck, B. Oscar Doyle, W. Woolsey, F. L. Wood, F. P. Welch, M. B.

Culver, I. Simpson, J. D. Pfiefer, A. R. Melendy, L. Augspath, J. W. Ayers, J. Adams Bishop, C. T. Brockett, A. J. Brown, H. J. Burkhart, C. S. Butler, Ellen R. Carr, I. N. Carr, W. G. Chase, C. C. Chittenden, Dwight M. Clapp, W. R. Clifton, S. B. Cook, W. H. Cooke, T. E. Craddock, Wm. Crenshaw, J. N. Crouse, Geo. H. Cushing, L. L. Dunbar, Geo. L. Field, S. W. Foster, W. B. Finney, J. E. Frazier, G. J. Friedrichs, Leo Greenbaum, Chas. S. Grindall, O. J. Gross, T. S. Hacker, Jas. S. Harris, C. S. Hardy, H. F. Harvey, Joseph Head, Thos. P. Hinman, J. E. Hinkins, D. M. Hitch, Geo. E. Hardy, Geo. E. Hunt, Lee F. Huffman, Henry A. Hull, J. Searl Hurlbut, C. S. Inglis, W. T. Jackman, F. A. Remington, B. J. Pressey, J. B. Pressey, J. W. Quattlebaum, C. B. Rohland, Wm. H. Richards, N. J. Roberts, D. N. Rust, B. Rutledge, R. M. Sanger, S. P. Sharp, N. T. Shields, A. H. Sibley, Chas. Sill, H. H. Sisson, J. W. Smith, M. B. Straight, John F. Stephan, B. Q. Stevens, R. W. Talbott, J. G. Templeton, H. C. Thompson, J. S. Thompson, J. L. Walker, R. H. Walker, W. W. Walker, J. W. Wassall, W. C. Wendel, T. L. Westerfield, T. P. Whitby, J. H. White, F. C. Wilson, J. L. Wolf, G. F. S. Wright, W. H. Baird.

SECTION IV. Histology and Microscopy.—T. L. James, chairman; L. L. Dunbar, secretary. H. T. Harvey, I. N. Broomell, Thos. P. Hinman, Louis C. LeRoy, Chas. K. Van Vleck, A. F. Sonntag, H. Jerome Allen, A. J. Brown, C. S. Butler, I. N. Carr, W. G. Chase, W. H. Cooke, J. A. Dale, I. B. Davenport, J. W. David, B. Douglass, A. R. Eaton, Edw. Eggleston, John E. Frazier, Joseph Bauer, F. Y. Clark, E. L. Hunter, D. N. McQuillen, W. J. Younger, F. J. S. Gorgas, John C. Oeland.

SECTION V. Materia Medica and Therapeutics.—J. S. Cassidy, chairman; A. W. Harlan, secretary. Wilbur F. Litch, S. C. G. Watkins, L. P. Bethel, Chas. A. Bland, P. S. Bollinger, W. T. McLean, M. F. Ault, W. A. Price, N. S. Hoff, Jas. Truman, W. E. Griswold, A. H. Peck, C. R. Jefferis, A. R. Starr, H. S. Sutphen, M. W. Foster, Geo. E. Hunt, S. J. Cockerille, W. W. Corley, B. F. Arrington, Chas. E. Dunn, W. H. Burr, M. C. Marshall, W. T. Cole, L. A. Smith, C. W. Stainton, J. A. Tigner, R. C. Young.

SECTION VI. Physiology and Etiology.—J. D. Patterson, chairman; L. E. Custer, secretary. J. E. Cravens, H. T. Harvey, W. Storer How, L. Ashley Faught, Emma Eames Chase, M. L. Rhein, H. A. Smith, J. P. Corley, Louis C. LeRoy, J. Howard Gaskill, J. Newton Giddens, N. J. Goodwin, C. U. Granger, Meta T. Haley, R. Finley Hunt, H. H. Jackson, H. R. Jewett, A. P. Johnstone, G. E. Johnson, R. H. Jones, Henry C. Jones, Victor S. Jones, H. H. Keith, R. N. Kesterson, A. B. King, Sam'l E. Knowles, J. Austin Dunn, T. M. Hunter, Jas. S. Knapp, D. R. Stubblefield.

SECTION VII. Anatomy, Pathology, and Surgery.—W. C. Barrett, chairman; W. F. Lewis, secretary. A. H. Thompson, H. T. King, S. Freeman, R. G. Richter, J. Lenox Curtis, G. V. I. Brown, Chas. A. Bland, J. A. Chapple, C. A. Brackett, M. L. Rhein, M. C. Smith, Thos. Fillebrown, T. T. Hayward, C. P. Pruyn, W. T. McLean, J. L. Asay, T. T.

Moore, T. W. Brophy, A. C. Ross, John S. Marshall, J. D. Thomas, Frank G. Gregory, W. H. Whitslar, S. B. Dewey, A. O. Hunt, F. A. Shotwell, A. G. Friedrichs, H. A. Lowrance, J. Thos. Lippincott, John D. Loetzerich, B. F. Luckey, W. A. Lyons, R. Maercklein, E. B. Marshall, F. J. Maynard, W. H. Morgan, A. L. Northrop, J. E. Orrison, T. H. Parramore, F. A. Remington.

SECTION VIII. Hygiene and Prophylactic Dentistry.—J. Taft, chairman; H. B. McFadden, secretary. L. P. Bethel, W. T. Martin, Edw. M. Kettig, I. P. Wilson, Howard S. Seip, Laurence Leonard, H. T. Harvey, J. A. Chapple, E. F. Adair, E. S. Holmes, W. T. Arrington, Louis C. LeRoy, H. G. Ulrich, Wms. Donnally, F. H. McAnally, H. C. McBrair, Geo. S. Nason, J. J. Nelson, A. A. Pearson, H. D. Boyd, J. C. Oeland, B. J. Quattlebaum, M. A. Bland, D. R. Stubblefield, E. D. Swain, B. H. Teague, Thos. E. Weeks.

SECTION IX. Orthodontia.—V. H. Jackson, chairman; C. L. Goddard, secretary. Howard S. Seip, J. N. Farrar, Alex. Jameson, Wm. E. Walker, A. H. Gilson, Eug. H. Smith, H. J. Goslee, C. W. F. Holbrook, W. E. Grant, R. Ottolengui, M. C. Smith, H. B. Noble, Louis Ottofy, Louis C. LeRoy, Frank G. Gregory, S. H. Guilford, J. W. Canaday, W. N. Cogan, L. D. Carpenter, Gordon White, H. E. Beach, C. S. Case, John R. Beach, H. A. Parr, E. D. Swain, R. C. Young.

SECTION X. Clinics.—H. J. McKellops, chairman; M. B. Culver, secretary. L. P. Dotterer, Wm. Conrad, W. St. George Elliott, B. E. Wright, Laurence Leonard, T. C. West, T. M. Wyatt, T. M. Allen, W. N. Le Sueur, E. P. Beadles, J. Edwin Boozer, I. Simpson, S. Dickson, W. J. Younger, E. P. Keerans, H. A. Parr, J. Austin Dunn.

On motion, adjourned to 2.30 P.M.

SECOND DAY—AFTERNOON SESSION.

The Association was called to order by the President at 2.45 P.M.

The minutes of the morning session were read and approved.

Dr. Patterson presented the following report, signed by a majority of the Committee on Credentials:

WHEREAS, The New Jersey State Dental Society has officially given its indorsement to a secret and proprietary medicine; therefore, be it

Resolved, by the National Dental Association, that the New Jersey Dental Society is hereby censured for violation of the recognized Code of Ethics, in giving such indorsement.

M. F. FINLEY,
J. D. PATTERSON,
Committee.

In connection with this resolution, Dr. Patterson quoted Standing Resolution IX, as follows:

Resolved, That the National Dental Association condemns the use of secret preparations known as "*local anesthetics*," as well as all other secret preparations.

Dr. S. C. G. Watkins, delegate from New Jersey Society, at the request of the Committee, stated the facts in the case.

The subject was discussed by Drs. Taft, Barrett, B. Holly Smith, H. J. Burkhart, Wms. Donnally, and McKellops. Dr. Crawford moved as an amendment to the resolution the addition of the words, "and that the Dental Society of New Jersey be requested to withdraw their indorsement of the nostrum."

The resolution, as amended, was unanimously adopted.

Dr. M. F. Finley called for the amendments to the Constitution proposed by him at the preceding session.

There being no objection, the amendments were adopted by unanimous vote.

Dr. H. J. Burkhart offered the following resolution:

Resolved, To amend Article VI, Section 3, paragraph 2, of the Constitution to read as follows:

"Commencing with 1898, the President shall be chosen from the division in which the meeting is to be held."

Under the rule, this lies over to a later session.

Section IV was called and passed, no representative of the Section being present.

Section V was called.

The Chairman, Dr. Cassidy, read his report, which was referred to the Publication Committee and passed without discussion.

Section VI was called.

The Chairman, Dr. J. D. Patterson, reported no papers from the Section, and asked the privilege of presenting his written report later, which was granted.

Section VII was called.

Dr. W. F. Lewis, Secretary *pro tem.* of the Section, read the report and announced the following papers:

I. "Anatomy, Pathology, and Surgery," report of the Chairman, Dr. W. C. Barrett. II. "Anatomy; a Critique," by Wm. Ernest Walker. III. "The Comparative Method of Teaching Dental Anatomy," by A. H. Thompson. IV. Paper by Dr. M. H. Cryer, illustrated with slides.

Dr. Barrett read his report, which was referred to the Publication Committee.

Before reading his paper, Dr. Walker asked permission to test a certain point in dental anatomy which he had made a subject of investigation,—namely, Whether the *molars* touch when the *incisors* are placed *edge-to-edge*. The members present were requested to note the condition, individually; in response, *five* stated that their molars do so touch; *thirty-five*, that they do not touch.

Dr. Walker then read his paper. Dr. Barrett moved that such portions of the paper as refer to Nomenclature be referred to Section II, to be reported upon next year, and that the paper be referred to the Publication Committee.

Dr. A. H. Thompson then read his paper, which was referred to the Publication Committee.

The Chairman of the Section reported that no lantern being available, and no evening left free by the Executive Committee, Dr. Cryer's contribution could not be presented at this meeting.

The papers were discussed by Drs. Brophy, G. V. I. Brown, Patterson, Barrett, M. C. Smith, Peirce, Crawford, Guilford, Walker, and A. H. Thompson.

Dr. M. C. Smith offered a resolution to the effect that Drs. Brophy and Fillebrown be invited to read papers at the next meeting of this Association, on "Surgical Operation for Cleft Palate." Carried.

On motion, Section VII was passed.

The Chair announced the Chairmen and Secretaries of Sections, as follows:

Section I.—I. N. Broomell, Chairman; Wm. Ernest Walker, Secretary.
Section II.—S. H. Guilford, Chairman; M. F. Finley, Secretary.
Section III.—J. Y. Crawford, Chairman; Frank Holland, Secretary.
Section IV.—T. L. James, Chairman; L. L. Dunbar, Secretary.
Section V.—J. S. Cassidy, Chairman; A. W. Harlan, Secretary.
Section VI.—J. D. Patterson, Chairman; L. E. Custer, Secretary.
Section VII.—W. C. Barrett, Chairman; W. F. Lewis, Secretary.
Section VIII.—J. Taft, Chairman; H. B. McFadden, Secretary.
Section IX.—V. H. Jackson, Chairman; C. L. Goddard, Secretary.
Section X.—H. J. McKellops, Chairman; M. V. Culver, Secretary.

On motion, adjourned to 9 A.M. Thursday.

THIRD DAY—MORNING SESSION.

The Association was called to order by the President at 9.30 A.M.

The minutes of the preceding session were read and approved.

On motion, the amendment to the Constitution, proposed by Dr. Burkhart at the preceding session, was called up for action, and no objection being offered, the amendment was adopted by unanimous consent.

Dr. A. W. Harlan offered the following standing resolutions:

Resolved, That the Secretaries of Sections are required to forward to the Chairman of the Executive Committee, sixty days before the annual meeting, the titles of papers to be submitted, with the names of the authors, in order that they may appear in the official program.

Resolved, That the Executive Committee shall prepare and mail to the members an official program, at least twenty days before the annual meeting. This program shall have a list of the hotels, the meeting place, and the railway or steamboat facilities for getting to the place of meeting from the principal points in the United States.

This notice shall be mailed to the journals at least one month before the annual meeting.

The resolutions were discussed by Drs. A. H. Thompson, J. D. Patterson, and C. N. Peirce, and were unanimously adopted.

Dr. Grant Molyneaux offered the following resolution, which was adopted:

Resolved, That a Committee of three be appointed, who shall prepare amendments to the Constitution, providing for an Executive Council, to whom all miscellaneous business shall be submitted without discussion, before final action is taken.

Dr. Cassidy offered a resolution that the outgoing President be made one of that Committee, which was adopted. The President accepted the position, and added to the Committee Drs. Molyneaux and J. S. Marshall.

Dr. M. C. Marshall offered the following resolution, which was adopted by unanimous vote:

Resolved, That in the future, when any entertainment is offered this Association, the matter be referred to the Executive Committee, who shall, after investigation, report to this Association before action is taken thereon.

Section VIII was called. No report, and no papers, no members of the Section being present.

On motion, Section VIII was passed.

The Auditing Committee offered a verbal report, which was approved.

Section IX was called.

Dr. V. H. Jackson, Chairman, read the report, announcing one paper by Dr. C. S. Case, entitled "Answer to the Criticisms of my Paper entitled 'Principles of Force and Anchorage in Movement of Teeth.'"

Dr. Case read his paper, which was referred to the Publication Committee and passed *pro tem.*, the time for the special order of business, the selection of the place of meeting and the election of officers, having arrived.

SELECTION OF PLACE OF MEETING.

Niagara Falls and Boston were placed in nomination for place of meeting. Total number of votes cast, 64; necessary to a choice, 33.

Niagara Falls, receiving 45 votes, was declared the chosen place.

ELECTION OF OFFICERS.

On the informal ballot for President, Dr. H. J. Burkhart (Batavia, N. Y.), receiving 46 out of the 66 votes cast, the informal ballot was made formal and Dr. Burkhart declared elected President.

On the informal ballot for Vice-President from the East, Dr. S. H. Guilford receiving 49 out of the 63 votes cast, the informal vote was made formal, and Dr. Guilford was declared elected.

The informal ballot for Vice-President from the West not resulting in an election, a formal ballot was taken, Dr. Thos. E. Weeks receiving 48 of the 61 votes cast; on motion, his election was made unanimous.

On motion of Dr. J. Y. Crawford, the Secretary was authorized to cast the unanimous vote of the Association in favor of Dr. B. Holly Smith, as Vice-President from the South.

On motion of Dr. J. N. Crouse, the Secretary was authorized to cast the unanimous vote of the Association in favor of Dr. Emma Eames Chase, as Corresponding Secretary.

On motion of Dr. A. W. Harlan, the Secretary was authorized to cast the unanimous vote of the Association in favor of Dr. Geo. H. Cushing, the honored and efficient Recording Secretary, to succeed himself in that office.

On motion of Dr. A. W. Harlan, the President was authorized to appoint an Assistant Recording Secretary.

Dr. Wm. Ernest Walker was accordingly appointed to that office by the President, to serve for the ensuing year.

On motion of Dr. J. Y. Crawford, the Secretary was authorized to cast the unanimous vote of the Association for Dr. H. W. Morgan, to succeed himself as Treasurer.

On motion of Dr. C. N. Peirce, the Secretary cast the vote of the Association for Drs. C. S. Butler, G. V. I. Brown, and J. Y. Crawford as members of the Executive Committee in place of Drs. C. N. Peirce, W. P. Dickinson, and Geo. Eubank, whose terms expire with this meeting.

Dr. J. N. Crouse tendered his resignation as member of the Executive Committee.

On motion of Dr. J. Y. Crawford, the resignation was laid on the table.

The discussion of the paper presented by Section IX was resumed, and continued by Drs. H. A. Smith, J. S. Marshall, and S. H. Guilford.

On motion of Dr. S. H. Guilford, the further discussion of Dr. Case's paper was made the first order of business for the afternoon session.

On motion of Dr. G. V. I. Brown, it was resolved that adjournment of the present session be to 2 P.M. of to-day.

Dr. Thos. E. Weeks, Chairman of the Committee to which were referred the reports from State Societies, submitted by Dr. Walker, under Standing Resolution X, read a report, which was accepted, and on motion of Dr. G. V. I. Brown referred to the Chairman of the Committee on State and Local Societies, Dr. J. Taft.

On motion, adjourned to 2 P.M.

THIRD DAY—AFTERNOON SESSION.

The Association was called to order by the President at 2 P.M.

The minutes of the morning session were read and approved.

The discussion of the paper of Dr. Case was continued by Drs. H. A. Smith, J. S. Marshall, and S. H. Guilford, and closed by Dr. Case.

The resignation of Dr. W. W. Shryock, Fort Wayne, Ind., was received and, on motion, accepted.

(Dr. J. S. Marshall here took the chair.)

On motion of Dr. A. W. Harlan, the matter of compensation of the Secretary, Assistant Secretary, and Treasurer was placed in the

hands of the Executive Committee, not being provided for in the Constitution.

Section I was recalled.

The Chairman, Dr. Molyneaux, presented an additional paper, by Dr. V. H. Jackson, entitled "The V. H. Jackson Compensating Bridge."

Dr. Jackson read his paper, which was discussed by Drs. Hungerford, Esterly, and Sitherwood, and closed by Dr. Jackson, and referred to the Publication Committee.

Section I was passed.

(The President here resumed the chair.)

The following amendments to the Constitution were offered by Dr. Laurence P. Leonard, and, under the rule, lie over till next year:

Resolved, That Section 2 of Article V be amended by adding: "the receipt for which will entitle the holder to all the privileges of the floor, including general meetings of the Executive Committee."

That Article VIII, Section 1, be amended by inserting after the word "Association"—before whom all business matters shall come, and—

In Article VIII create Section 10, as follows: The Executive Committee shall elect a President and Secretary, and shall hold daily general sessions during the meetings of the Association.

Create Article XV, as follows:

Article XV, Section 1: After 1899 nothing shall come before the general session of the Association except the President's Address, Announcements, Election of Officers, Selection of Place of Meeting, and the Reading and Discussion of the Scientific Papers indorsed by the Sections.

Section 2: Anything in conflict with this Article is hereby repealed.

The minutes were read and approved.

The Chair appointed Drs. Crawford and Patterson to conduct the President-elect to the chair.

Dr. Burkhart acknowledged the honor conferred, and, taking the chair, announced the following committees:

Publication Committee—C. N. Johnson, C. N. Peirce.

Local Committee of Arrangements—C. S. Butler, D. F. Bentley, M. O. Cooley.

Committee on National Museum—Williams Donnally, H. W. Morgan, John S. Marshall.

The Executive Committee announced the appointment of Dr. L. E. Custer, Dayton, Ohio, to deliver a general address on "Electricity;" and of Drs. T. W. Brophy and Thos. Fillebrown to deliver addresses on "Surgical Treatment of Cleft Palate."

The final minutes were read and approved.

The Association then adjourned, to meet at Niagara Falls, the first Tuesday in August, 1899.

WM. ERNEST WALKER, *Assistant Recording Secretary.*

REPORT ON NECROLOGY.

THE Committee on Necrology have to report that during the past year the Association has lost two active members by death.

DR. WM. E. RICHARDSON.

Dr. W. E. Richardson, of Batavia, N. Y., was born February 8, 1858, at Tecumseh, Mich., the son of a Universalist clergyman, Rev. C. C. Richardson.

Inheriting from his father a desire for study, he received a thorough course of instruction, literary as well as professional, and commenced the practice of dentistry in Bradford, Pa. In 1880 he removed to Batavia, N. Y. Industry, professional skill,—especially as an operative dentist,—and genial disposition brought him a clientage whose esteem and confidence he held by his unswerving fidelity. His constant and close attention to business seemed to predispose him to disease, so that after an illness of only twelve days with broncho-pneumonia of typhoidal type, following fibrous bronchitis, he succumbed, dying on December 5, 1897. Surviving him are his wife, Mrs. Hattie Moulton, and three children, his eldest son, Elbridge M., being a student in the Baltimore College of Dental Surgery.

ALONZO BOICE, D.D.S.

Dr. Alonzo Boice, of Philadelphia, was born March 12, 1847, in the town of Canajoharie, N. Y., receiving a common school education in the locality of his native town, where he was noted for proficiency in mathematics, mechanical skill, etc. At the age of fifteen years he commenced the study of dentistry with Dr. M. M. Frissell, of Kingston, N. Y.

Though his preceptor offered him an interest in his business, he preferred to pursue his studies under more auspicious circumstances. He entered the Philadelphia Dental College and graduated therefrom in 1869. Owing to his skill and interest in the prosthetic department, the faculty of the school urged him to

accept the position of demonstrator of mechanical dentistry. As an instructor he was efficient and popular, and will long be remembered with gratitude by the students for his patience and thoroughness; he was by nature a teacher.

Completing his professional education, he opened an office in Philadelphia, where for nearly thirty years he enjoyed a compensating clientage.

Dr. Boice labored conscientiously for the elevation of his profession, and while he subjected himself to some criticism, his unselfishness and his integrity were never doubted. As a member of the American Dental Association he was always an active and efficient worker in the Section on Prosthetics, being frequently appointed its chairman, and when in this position always having his report ready when the Section was called. He was also an active member of the State and local societies, holding positions of trust and honor.

In his death at Kingston, N. Y., February 2, 1898, the profession lost a willing, active, and efficient worker, and an honorable member.

Dr. Boice never married.

J. TAFT,
C. N. PEIRCE,
Committee.

ANNUAL ADDRESS.

The Value of Organization.

By THOMAS FILLEBROWN, President.

ORGANIZATION is essential to the success of any movement in which the combined effort of several individuals is desired.

It converts the irresponsible mob into the disciplined and responsible army. It is the fly-wheel of progress which gives balance to combined effort, brings up and pushes forward the laggard of conservatism, restrains the erratic flight of the too exuberant enthusiasm of the reformer, gives steadiness to action, and makes advancement sure. It makes the collection the unit, and holds the special privileges of the individual subject to the will of the body for the good of the whole.

Nations, peoples, and communities require formulated rules for their government and control. An association of persons for the promotion of scientific investigation is but a small municipality, and demands the same organization for its successful advancement, and the value of the organization depends upon the faithfulness with which it represents the most advanced thought of the body adopting it.

This necessity of humanity has firmly established three kinds of laws. The first form adopted was the Statute law, changeable at any time by the will of the body which made it.

The second form was the enactment of the principle of the Statute law into a more permanent form which requires a more complicated proceeding to change it, as a formal notice at some

meeting previous to the one at which the vote for change can be taken. This is Organic or Constitutional law.

Common law is that deduced from generally accepted principles and not the result of legislative action.

"Laws to be effective must express the will of the people or body which is to be controlled by them. They are not the production of a single inspiration, but are the historic outgrowths of the knowledge, opinions, and sentiments of progressive periods, and a change in them rather accompanies or follows than precedes a change in the public standards of thought and action. Increased knowledge, a change in public opinion, or the demand of changed circumstances may without other action render a statute obsolete.

"It is a curious fact that the tenure of villenage, by which more than half the lands in England were at one time held, reducing the people to a state of vassalage, owes its extinction to no act of Parliament. It gradually yielded to the force of public sentiment and the influence of the courts, till it practically ceased.

"Laws are the measure of progress. Legislation is the mirror of public life, the images of one period slowly changing into those of another.

"Good laws are not found in a corrupt age, except as a part of his patrimony may remain in the hands of the dissolute heir.

"A cultivated and enlightened people will not tolerate evil laws. If they remain it will be only as dead branches upon an old tree, soon to fall. New truths must at length force their way even into the text of the statute books.

"Laws must change, unless society is stationary. So every advance in thought, in morals, or intelligence, the law in its own way and time is sure to adopt. It grows out of the life of the people and changes somewhat with the changing soil and climate in which it flourishes."*

Institutions are molded as the stately tree is shaped in its growth. While we may not admire the results or approve the means by which public opinion is formed, it is folly to question the soundness of a principle which gives steadiness to established things.

These principles applied to our own professional organization will, I think, exonerate the past from much unfavorable criticism which it has received, and make seem much brighter the future of our present Association.

Our organizations of the past were as good as the material of which they were composed would afford.

Our present Association will be no better than the knowledge, culture, and enthusiastic efforts of its members shall make it.

*S. J. Symonds.

Constitutions will not furnish brains, culture, or application. Standing rules will not compel research or write papers. On the other hand, no by-law will prevent the student from seeking out the hidden mysteries of Nature, nor can the announcement of the results of investigation be long delayed by prohibitory legislation.

As applied to scientific bodies, organization is a plan agreed upon by the body, by the following of which the members can work together to accomplish the best results in the encouragement of more diligent research and in promoting interchange of knowledge. Prohibitory laws aid by preventing the vagaries of the individual interfering with the interests and progress of the many.

The time is not long past when to be a good parliamentarian seemed to be the highest ambition of the presiding officer, and questions of order gave rise to the most animated and prolonged discussions of the session and often overshadowed the scientific questions in the interest and attention of the members. Happily this is all changed. Now science is to the front, and the presiding officer is prized only as he makes himself useful in promoting the consideration of the higher scientific objects which claim attention. This fact is one of the strongest indications of the real and true progress of our profession, and to every thoughtful person is a cause for satisfaction and encouragement.

This principle should be borne in mind in the consideration of the amendments to the Constitution which propose to change the name of the Association. The present name was recommended as the result of a consensus of opinion obtained by an extended correspondence with interested members of the old Associations. The fact that National Dental Association so well harmonized with National Association of Dental Faculties and National Association of Dental Examiners was urged as a cogent reason for its adoption. Is not substance of more importance than any decoration? Yet the wishes of the greater number should be preferred, and if the larger number think better work can be done under a different name such a name should by all means be adopted. We commend the subject to your considerate judgment, believing it will be decided according to the best interests of this body.

You will notice that no code of ethics has been adopted by this Association. Your wisdom will decide if such is needed, and if needed, whether the extended form which governed the older

associations is best, or a more concise form, limited to a declaration of the principles which should govern the conduct of the members as "becoming ladies and gentlemen."

The things most essential to the success of our Association are brains, education, application, enthusiasm, and an unselfish devotion that will bring and lay on the altar of Science all the sweet incense of the best efforts of every member. Add to these the desire to learn from our neighbor, as we are bidden to hunger and thirst after righteousness, and we shall realize our ideal of a professional association. Self-interest cannot be wholly disregarded, but it must be kept well in the background, and "Such as I have I give unto thee," which is the motto of the truly professional spirit, must be the governing principle of a progressive, scientific body. Unselfishness is the essential of professional ethics.

As in mankind we find love and hate, forgiveness and revenge, liberality and avarice, so in our professional societies we find the professional spirit opposed to the commercial spirit. The first says, "Come buy wine and milk, without money and without price." The second says, "Man's necessity is my opportunity; I will use it to the utmost extremity." In business the blunt command of olden time, "Stand and deliver," is now softened and enforced under the guise of combinations and restricted productions. Business ethics permits the use of any and all means within the limits of statute law to capture a customer of a competitor. Professional ethics demands that a man shall use every means compatible with the interests of the patient to keep him loyal to his professional adviser.

Business *must* be governed by the selfish principle, but if honestly and fairly applied no one will be wronged or injured. Professional relations must be governed by an entirely unselfish principle, and to him whose life is controlled by it, regulated by good common sense, no loss will come. Human hate and Christian love cannot dwell together on equal terms in man's weak, finite nature. We cannot at the same time serve two masters. God or Mammon will demand and have our allegiance. Oil and water are both essential to the human economy, but will not mix.

This lesson is applicable to our own present circumstances. The

time was when the business houses sought their managing agents from the ranks of practitioners, who while in their new relations retained their membership in professional associations. Gradually the condition has changed until now with scarcely an exception the connection of the business firms is continued through the entirely legitimate relations of the membership of the editors of their journals.

It will be a grave mistake for this Association to allow business ethics and business interests to again enter into the conduct of its affairs. Picture for a moment a majority of this body being pecuniarily interested in the profits that can be made on the sale of goods to their brother practitioners; or this member being appointed on a committee because he holds a large block of stock; or another being elected President because he can influence large sales of dental goods. The bare mention of the condition seems sufficient to prevent the possibility of its obtaining. Still, let us be on our guard lest under the guise of a blessing elements inimical to the welfare of our Association gain entrance and become established. Remember the Trojan horse. As was prophesied of our Nation that it would become either all slave or all free, so our Association must be dominated by either professional or business ethics. They cannot exist together. We shall "Hate the one and love the other, or hold to the one and despise the other."

The main features of this organization are the same as have proved favorable for such bodies for many years, and have enabled them to do the best work of which they are capable.

As we progress in scientific attainment and interest, changes of course will be found necessary and desirable. One of them may be to leave all matters of business to some representative council, so that the entire time of the members may be devoted to the consideration of matters of scientific and professional interest.

The two distinctively new features of our present constitution are, first, the creation of the divisions of the East, West, and South, and the holding of the annual meetings in each of them consecutively; and, second, the provision for the formation of branches.

The cosmopolitan character of the first cannot fail to be productive of good, especially in awakening a wider interest in the meetings and increasing the number of members and guarding against sectional control. The good offices of the second are not

so self-evident, but we may reasonably expect that through its influence, when understood, a large number will become actively and permanently connected with the Association and work in harmony with it that would not otherwise join its ranks. It has certainly done good thus far. It has made this grand National Association possible, and brought into harmonious action and sympathy the sentiment and energies of a reunited profession. Its practical and successful working has been shown by the Southern branch during the present year. I commend and venture to prophesy repetitions of such success by the Southern branch and by many others yet to be formed. The number of branches is not limited. In whatever State, county, city, or town few or many members may reside, there they may gather together and organize a branch of the National Association, and work in harmony with and as a part of the parent body, and forward their proceedings to the National officers for publication in the annual volume of the Association, thus making it a complete record representing the scientific progress of the profession during the year, to be placed upon the shelves of the library of every member.

Experience must prove whether the present division of the annual dues is best. When this was recommended there were no data upon which to base an estimate of the necessities of the case. No one could judge of the expenses of the meetings of the branches. Time may show that it will be best for each branch to pay its own expenses outside of the annual dues, excepting perhaps the salary of a stenographer for his services. The attention of the members is called to this point for present action or for recommendations for the future.

It is an open question whether or not the number of delegates from State societies is not too much restricted, and whether the method of appointing is not more complicated than is necessary; also, whether by refusing delegates from other local societies many of the best men will not be kept out of our ranks.

The fact that all ought to belong to their State society is a very strong argument in its favor, but the fact that all do not see their duty and prefer it as we see and desire it for them weakens the argument somewhat in its application to the case before us.

It is also an open question whether it would not be better for the interests of the Association to provide for the election of the

President from the division in which the next succeeding annual meeting is to be held, instead of as at present.

The value of professional organization to-day is not simply in bringing together the great, the good, and the wise to exchange congratulations upon what the few know more than the many, but in that the many may meet the few and that knowledge, culture, and refinement and a true professional spirit may be more widely diffused and better appreciated. Hence, open wide the doors and go out into the streets and by-ways and compel men to come to the feast. Remember that giving is gaining, teaching is learning. The Master suffered no loss when he felt virtue go out from him. Personality is a great power. No one can get from another the full benefit of his thought and teaching until he has grasped the hand and felt the personality of the leader and teacher. The time is past when a self-constituted few can gather together and bid the masses behold, admire, respect, and obey the great "We are." No select few are now enough greater than the many to compel any such homage. Greatness is attained by the acquisition of knowledge. Honor is accorded to those who impart their knowledge the most freely.

Important questions affecting the future of this Association which deserve your thoughtful consideration will be presented by the special committees. The report of the Committee on the establishing of a journal of the Association is of special importance. The influence of such a journal would be invaluable for the good of the Association. If your wisdom shall devise a practical scheme for its success, every one will feel rejoiced in its accomplishment.

To me the future of the National Dental Association seems to be especially bright and encouraging. Its formation has combined the professional interests of North America.

A common enemy has united every political sentiment in the land in common devotion to the cause of the extension of the rights of humanity and the elevation of mankind, and has awakened the latent sympathy existing between all nations and peoples of the Anglo-Saxon race, and inspired a wholesome respect for this nation throughout the whole world. Under such favoring circumstances success is already assured.

This is a profession that does not linger to do homage to the

gods of the past. "Its worship is of the morning, not of the evening. In its ear the single word of the adventurous explorers drowns the voices of the multitude singing snatches of old tunes. Revolution has no terrors here. A single ray of new truth may dissolve and recreate a system. Whatever of shadow may have hung over our profession in the past, whatever of evil may have attended in its way, whatever of prejudice, jealousy, ambition, or adverse interests may still exist, there is light upon its pathway in the future. The journey through the desert must have been made, but now on the heights a radiant pathway lies before it. The spirit of the age is with it, and it is one with the potent forces that advance knowledge, shape thought, and mold the life of our times."

The future promises much for the increase of scientific knowledge, the advancement of professional interests, and the promotion of the welfare of humanity.

Report of Special Committee on President's Address.

MR. PRESIDENT and Members of the National Dental Association:

We, your Committee, to whom was referred the President's Address, beg leave to make the following report:

Your President, in his address, called attention to the fact that you have adopted no Code of Ethics. It is the judgment of your Committee that a code should be adopted, and we further recommend that a committee be appointed to formulate a code and present it for your consideration.

We fully concur in the recommendation of the President, that all routine business should be placed in the hands of a representative council, so that the entire time of the members may be devoted to the consideration of questions of scientific and professional interest.

Your Committee believes that the number of delegates might be advantageously increased by allowing each State Society to elect one for every six of its membership, instead of one in ten, and that the manner of their selection shall be left to the societies themselves.

Your Committee recommends, in addition, that after 1898 the President be elected from the district in which the next annual meeting is to be held.

Respectfully submitted,

H. A. SMITH,
C. L. GODDARD,
FRANK HOLLAND,
Committee.

SECTION I.

Prosthetic Dentistry, Chemistry, and Metallurgy.

REPORT BY GRANT MOLYNEAUX, CHAIRMAN OF THE SECTION.

SECTION I begs leave to report as follows: Chemistry and Metallurgy have offered very little of special interest during the past year. That which has been offered on the subject of chemistry has been so closely interwoven with materia medica and therapeutics that it may be properly considered under that Section.

Prosthetic dentistry has occupied the attention of the profession to some extent during the year, but the larger proportion of this attention has been directed principally to the details of mechanical operations or mechanical procedure rather than to principles. There is no department of dentistry where empiricism holds such sway as in prosthetic dentistry. When we can secure more attention to the underlying principles of dental prosthesis, and less to details of mechanical procedure, we may hope to see the Section on Prosthetic Dentistry occupying as prominent and interesting a position as other Sections of this body.

The Section will offer one paper this evening, a paper by Dr. Custer, on "Electrical Fusion," and asks the privilege of submitting a supplemental report later, as we expect two other papers that are not yet quite ready.

SECTION I.—Continued.

The Improved Electric Oven and the Means of Determining the Heat in Fusing Porcelain.

By L. E. CUSTER, of the Section.

LIKE many other inventions, the electric oven has gone through a change which has resulted in a practically perfect instrument. It is a satisfaction to the writer to know that the first oven, crude as it was, was received so generously by the profession. The difficulties that were met and which have been overcome, one by one, and the amount of time and expense entailed are almost inconceivable. The difference between the melting-point of high-fusing porcelains and the platinum wire which produces the heat is very small, and yet it is within this narrow margin that the electric oven operates. It was said by one who presumed to know, that a platinum wire could not be heated hot enough to fuse porcelain over twelve times without undergoing such a change as to ruin it. There is no question but that a slight change does take place in the molecular arrangement of platinum when repeatedly heated almost to the point of melting.

The amount of abuse to which the oven was first subjected, because it seemed a toy as compared with gas and coke ovens, has not been without some good results. The dentist invited in his neighbors to show how hot he could make it; he tried to make calcium carbide in it, and even tried to melt his scrap platinum in it. Who ever heard of the successful melting of one piece of iron by holding another piece of hot iron close to it? These are only a few of the abuses that have come to the surface.

The perfection in detail of the electric oven has all been in the

direction of producing the highest heat in the oven cavity, with the lowest possible heat of the platinum wire. In other words, step by step I have reduced the necessary heat of the platinum wire. It is evident that since porcelain is fused by heat radiated from the wire, the wire must always be a little hotter than the porcelain, but by perfecting every available point which will be of advantage I have succeeded in lowering the necessary heat of the wire to a point which the platinum wire will withstand for hundreds, and perhaps thousands, of heatings. Professor Haskell has used such an oven for two years without a single burn-out, and Dr. Thomas reports having used nearly one hundred ounces of Close material without a burn-out, a conservative estimate of which would be that each oven was heated from 800 to 1200 times.

The first improvement consisted in conforming the oven cavity more closely to the shape of a set of teeth and in making every inch of the cavity-walls heat-producing surfaces, except the two small openings. Every wire that can be introduced to radiate heat decreases the required temperature of the others, and the closer the wires can be arranged without touching laterally, the better. Hence, by making every inch of the inner surface a heat-producing surface with no open ends, the highest efficiency is secured as well as an even fuse to the porcelain case.

The second improvement consisted in bringing the wires to the surface of the clay. When the oven was first made, the wires were covered with a thin layer of clay for the purpose of keeping them in place and protecting them from metals and from injurious material used for investments. The majority of dentists did not know that the pumice stone investments would melt in a heat necessary for melting high-fusing porcelains. I soon ceased burying the wires in the clay, and by short curves was able to place them on the surface just deep enough to be caught. By this arrangement nothing intervenes between the wire and the object heated, so that the wire is not heated as hot as previously. Precisely in proportion to the distance of the wire from the porcelain and to the thickness of an intervening wall, if any, the temperature of the wire has to be raised above that of the porcelain treated.

Theoretically, if the wire could be suspended in the oven cavity without touching the walls at all, the best conditions would be

attained, and while the wires do not ordinarily break from their investment, owing to the manner of arranging them in short curves, if they should, so long as they do not buckle to the extent of touching a neighboring wire the conditions are improving and the oven becomes more efficient.

The third improvement was in the manner of arranging the wires. The first oven made contained the wires arranged the same distance from one another all over the heating surface. I soon saw that the center of the oven became the hottest, and that the heat of the side walls was far below the heat in the center. A plate fused in such an oven would be overheated in the palate or not fully fused around the rim. These ovens burned out in the center because of the overheating of the wires at that point. It may seem strange that an oven not spherical in shape would become hotter in the center, even if the wires were placed the same distance apart all over the surface. But it is true, and this condition was met by beginning at the center and arranging the wires closer together as the distance from the center increased. By this arrangement the whole inner surface of the oven cavity has the same heat. This was an important step, and I am gratified to see it being copied in late electric culinary utensils.

The fourth improvement was one which was arrived at only after the study of the working of over a hundred ovens. It was not generally known, if known at all, that the negative end of a wire heated by a constant electric current becomes about one-fifth hotter than the positive end, and I am yet without positive information why, and no one of whom I have inquired has been able to give a satisfactory explanation. This does not become apparent in a wire heated in the air, but in the electric oven it is present, and accounts for the trouble that has arisen at the negative end. I found that it was always the negative end that gave the trouble, that it was due to the overheating of the wire at that terminal, and that when I wound an oven with the negative end of the wire larger than the positive end I overcame the last and most perplexing problem of the oven, which may now be said to be perfect in every detail under intelligent use.

I wish to bring to your notice two appliances for determining the heat of the oven. One is by the use of a thermometer, and the other by the use of a small arc light. The thermometer is a

modification of one first used by Dr. J. R. Callahan, of Cincinnati, and the arc light is my own.

Dr. Callahan used a high-reading thermometer by placing the bulb of it in a clay stopper, molded to fit the upper opening. This quite accurately measures the heat of the oven. For my own use I secured a high-reading thermometer, called a "pastry" thermometer. This is about six inches long and reads to 600° F. Instead of placing the bulb of this in the clay stopper, I use a 20-gauge platinum wire, allowing one end to enter the oven cavity three-eighths of an inch and the other end to terminate outside in a cup large enough to inclose the bulb of the thermometer. This wire runs straight through the stopper which holds it in place, and is shown in Fig. 1. By using the wire, the heat is conducted from the oven cavity more accurately than by the clay stopper, and the heat of the cup, while not as hot as the one in the oven, is always exactly proportionate to the heat in the oven, and a scale having once been made can always be depended upon thereafter. If it is desired to be accurate to a hair's breadth in the fuse, it can be done by using a pellet of gold, which can be seen to melt, as the basis of calculation. When the gold melts it is only necessary to turn off the current when the mercury reaches

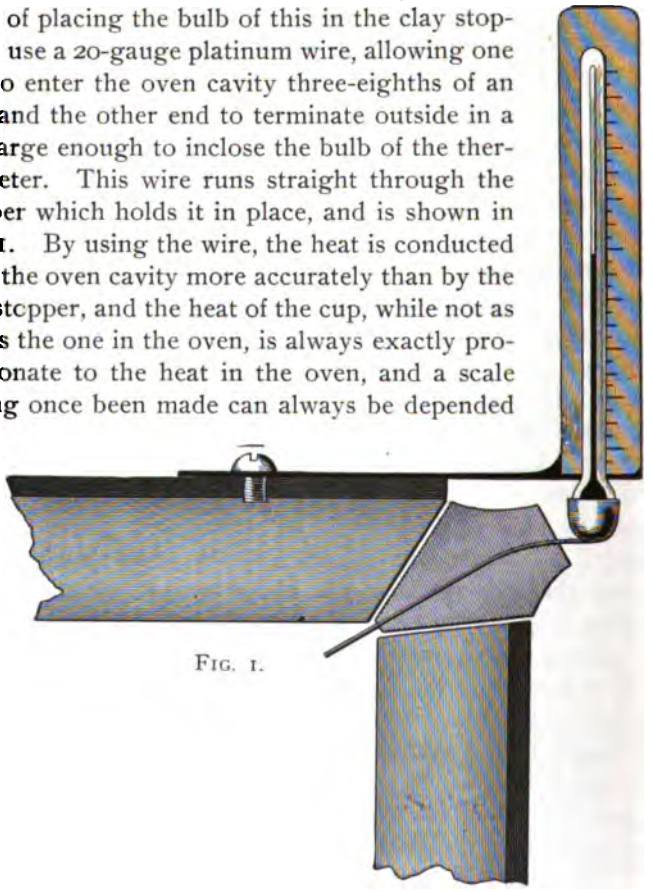
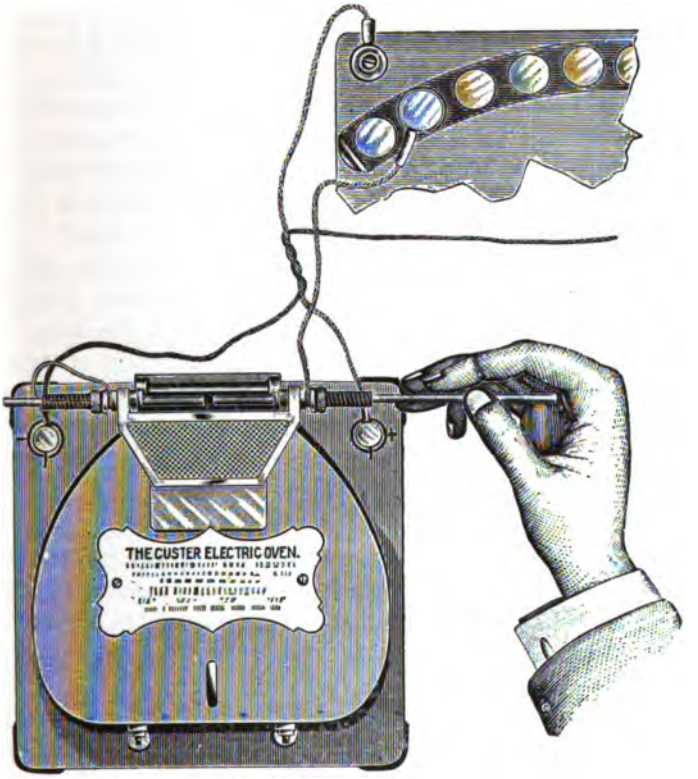


FIG. 1.

six points above the melting of the gold for Close body, or four and one-half points for Close gum.

By the use of the thermometer as above described it is possible to fuse porcelain to any predetermined degree with perfect accuracy, and it is so easily done that the operator will find pleasure in doing it, as he can with perfect assurance relegate this important

FIG. 2.



operation to his assistant. Compare this for one moment with the uncertainty and guesswork of coke and gas furnaces, and you can in a measure realize what has been accomplished.

If the operator does not care to employ a mechanical method like the thermometer for determining the heat, and desires one over which he can have complete control, the arc light, which I will now describe, will be a revelation to the old-time porcelain

worker. When the oven was first invented I found it difficult to tell the exact degree to which the porcelain had fused, and this I, in a measure, overcame by placing a small opening in the top which would admit a ray of light of different color from that of the oven, and in that way make the surface visible. It is not always possible to use a ray of sunlight for this purpose, and I now substitute the next thing to it, an arc light. By means of a little framework placed on the top of the oven a small carbon is held opposite the upper opening, and another carbon is held in a guide. This is shown in Fig. 2. The second carbon is movable. When the operator desires to see the porcelain melting, the movable carbon is pushed toward the fixed carbon till the two are in contact. The movable carbon is then withdrawn a short distance, and a brilliant arc will be struck which throws such a strong light in the oven that the operator viewing the case from the front opening sees the porcelain melt as distinctly as if it were in the open air. He has absolute control over the case, and he knows to a certainty to just what degree the porcelain is fused. With this there is no guess-work, and the eye is relieved of the great strain of trying to make out an indistinct object. I cannot too strongly call to your attention this little device, almost as marvelous as the oven itself, which supplies a want as old as porcelain work in dentistry.

DISCUSSION.

DR. H. A. SMITH: I should like to ask Dr. Custer if there is any method whereby we can melt platinum scraps so that they will be just as good as the original metal. I have seen Dr. Custer melt platinum scraps, but have the impression that they were not suitable for use. Has he overcome that difficulty?

DR. CUSTER: In reply to Professor Smith, I will say that I devised two methods for fusing platinum. They are both by means of the electric arc, however. One is the fusing of platinum upon a block of carbon by holding the electric light carbon in the hand. When the platinum is melted in this manner, it takes up carbon during the melting process, and the result is similar to that which follows when soft iron becomes hard, because it has taken up carbon, becoming steel. In the same way platinum takes up carbon and becomes very much like platino-iridium. When you wish to have soft and ductile platinum, you must keep carbon

away from it. At the last meeting of the Illinois Society I read a paper on that subject, showing how that could be done. Instead of resting the platinum scrap upon a block of carbon, take a block of lime and pile up your scraps of platinum over a platinum wire resting upon the block of lime. Then instead of using a piece of electric light carbon in the hand, use a platinum-pointed piece of metal of any kind, about three-quarters of an inch in diameter, and strike an arc with that upon your scrap. Then you will have platinum melted in the presence of nothing but lime, which does not affect the platinum. There being no carbon present, platinum melted by that process is just as soft and ductile as any new platinum which you can buy.

DR. MOLYNEAUX: To be able to tell the exact degree of fusion is a very important feature, and, having used Dr. Custer's arc light, I can verify what he has said.

DR. TILESTON: I should like to ask Dr. Custer if the illumination which he receives by means of this carbon is different in its convenience or sufficiency from the light that illuminates the Downie furnace. One free wire running through illuminates that furnace so we can very readily see the fusion. Of course the two lights are of a different character, one being an arc light and the other an incandescent one; but does the light of which he speaks give a better view of the fusing body?

DR. CUSTER: Just as much difference as the arc light is from the incandescent light. You can not only see the porcelain melt, but you can see it begin to drop down as plainly as you can see salt begin to do so when you pour water upon it; you can see the different particles begin to coalesce. And finally you can not only see the glaze, and to what extent it is fused and how smooth the surface of the porcelain is, but you can view every part of the plate much more distinctly. There is no comparison between the incandescent light of the Downie furnace and the arc light shown here.

SECTION II.

Dental Education, Literature, and Nomenclature.

REPORT BY S. H. GUILFORD, CHAIRMAN OF THE SECTION.

YOUR Section would report that the past year has been prolific of text-books and works bearing on professional practice. Some are entirely new, while others are revised editions of standard works already familiar to the profession. Of the new works, we have no less than three that treat of pathological conditions and one on cataphoresis.

"Dental Pathology, Therapeutics, and Pharmacology," by Professor H. H. Burchard, is an elaborate yet somewhat concise treatment of the three branches named in the title. His treatment of the subject of Pathology is in accord with the accepted views of our best authorities, and the principles are so set forth as to be readily grasped and mastered by the student. It is a companion work to the two text-books on operative and prosthetic dentistry issued last year.

"Oral Pathology and Practice," by Professor W. C. Barrett, deals with the subject of Oral Pathology alone. While covering the subject fully, it is concise and clear, and seems admirably adapted to class instruction. The printing of the leading words of each paragraph or section in large type so as to catch the student's eye is an excellent idea and greatly to be commended.

"Comparative Dental Anatomy," by Professor A. H. Thompson, is the first work of its distinctive character ever published in America. The subject is fully covered, and the information con-

veyed in simple and direct language. It is a text-book, and well calculated to serve its purpose.

"Chronic Alveolitis," by Dr. H. S. Nash, is an elaborate treatment of the subject of Pyorrhea Alveolaris in two volumes, only one of which has as yet appeared. It is not a text-book, but a treatise, and the author's views and methods of treatment are original and differ largely from those commonly accepted.

"Cataphoresis," by W. J. Morton, M.D., is a book resulting from Dr. Morton's experiments and work in the line of electrical osmosis, which he did so much to bring to the attention of the dental profession.

Of the new editions of existing books we would mention "Dental Anatomy," by G. V. Black, M.D. (4th edition); Harris's "Principles and Practice," by F. J. S. Gorgas, D.D.S. (13th edition); Tomes's "Dental Anatomy" (4th edition); Tomes's "Dental Surgery" (3d edition); "Orthodontia," by S. H. Guilford, D.D.S. (3d edition).

All of these latest editions show thorough work on the part of their authors in eliminating obsolete methods and matter, and introducing instead that which is new and in harmony with the advanced thought of to-day.

During the year Dr. J. N. Farrar has issued the second volume of his elaborate and exhaustive treatise on Dental Irregularities. This volume is devoted to the practical treatment of cases, and is very full and complete.

It will be observed that most of the works published are designed for college instruction, and that nearly every one is confined to a single subject. The day in which the subject of dental practice can be comprised in a single volume, no matter what the size, is long since past, and the separation of the different subjects and their individual treatment is an indication of healthy growth and advancement.

Your Section would suggest that in the publication of future text-books, or in the preparation of new editions of present ones, the authors prepare and include a glossary of terms employed. This might have its place either before or directly after the table of contents, and would prove of invaluable aid to the dental student. Inasmuch as a need has long been felt and expressed for a comprehensive dictionary of dental terms, giving their proper

orthography, pronunciation, etymology, and definition, your Section, after carefully considering the matter, has decided to take the first steps toward the production of such a work. To this end, and in order that the work may be as complete as possible, and also that the labor may be lightened by being divided, we ask the co-operation of this entire Association, and would suggest that the Chairman and Secretary of each of the ten Sections take steps at once to secure a list of all the important words in their respective branches and send the same to this Section at as early a date as possible.

To the current periodical literature of the profession three new journals have been added during the year: *The Indiana Dental Journal*, of Indianapolis, Ind.; *The Dental Century*, of Madison, Wis., and the *American Dental Weekly*, of Atlanta, Ga. The first and last of these periodicals are edited respectively by Dr. George E. Hunt and Dr. B. H. Catching, both members of this Association.

Your Section has two papers to present upon the subject of Nomenclature, both by Dr. Wm. Ernest Walker, of Pass Christian, Miss.

S. H. GUILFORD, *Chairman.*
M. F. FINLEY, *Secretary.*

SECTION II.—Continued.

A Suggestion in Nomenclature—"Cast and Model."

PAPER BY WM. ERNEST WALKER, OF THE SECTION.

IN the discussion of the report of the Committee on Nomenclature of the American Dental Association, by the Academy of Stomatology of Philadelphia, in June, 1896, Dr. S. H. Guilford, the Chairman, said,—"A great deal of confusion surrounds the two terms, *cast* and *model.* Some years ago I inquired of the son of Hiram Powers, the sculptor (the son being a student at the Philadelphia Dental College at the time), What is the distinction sculptors draw between a cast and a model? He answered that a model was something that was copied; a cast was a body formed in a mold. An arbitrary distinction has been suggested, so far as dentistry is concerned, by making model serve as the title for a plaster cast which is to be reproduced in metal; cast to be applied to the plaster not so reproduced. The distinction is not fully accepted; the practice of calling all plaster casts models appears to be more acceptable.* Accordingly in the list of terms of which it was recommended by the committee that the use be discontinued, the word cast is found."†

With all due deference to the Committee of the American Dental Association and its distinguished Chairman, Dr. S. H. Guilford, this recommendation does not appeal favorably to my judgment. That a distinction should be drawn between a cast and a model has been made very evident to me, not only in my relations with my laboratory assistant, but more especially in connection with my college work, and it has been found advantageous to impress

* *International Dental Journal,* August, 1896, page 522.

† *Dental Cosmos,* December, 1896, page 1023.

the distinction upon the minds of the students in this wise: The first step, after the preparation of the mouth, is the *impression.* This forms a matrix in which is poured *the cast.* It may be a metal cast, which, if for swaged work, would be called a die, but if a plaster cast for the construction of a vulcanite, celluloid, or cast denture, the cast never becomes a model of anything, being simply a cast of the mouth. If, however, it is decided to make a die for swaged work, by obtaining a matrix in sand, it then becomes necessary to make *a model,* by so shaping this cast with wax, or plaster, that it will accurately represent the die which is to follow; in which case, the cast undoubtedly becomes a model of the future die. The successive steps and products are, therefore, represented as follows: 1st, impression; 2d, cast; 3d, model; 4th, matrix; 5th, die; 6th, counter-die. As one of many incidents showing the confusion arising before the adoption of this plan, the following actual occurrence will serve as an illustration:

A student was one day talking to me about his "model." I soon found from his remarks that he did not have reference to what I had in mind as *a model,* and thought perhaps he meant his cast. Later, I saw that that was not what he was speaking of either, and I finally found that he was speaking of his die. The consecutive series,—cast, model, die, and counter-die,—is easily fixed in the mind, and thenceforth there is no confusion surrounding the terms, each one of which represents a definite stage in the production of an artificial denture, and is clearly before the mind's eye as a well-defined object to which neither of the other terms in the series could properly be applied. If I hand my assistant an impression and tell him to make a plaster cast, he makes a cast in the ordinary way for vulcanite or celluloid work, but if I tell him to make a model he wraps paper around the impression so as to make the cast thick enough to be trimmed into the proper shape for a model of the die which is to follow. It therefore appears to me that we should at least hesitate before adopting the word model to the *exclusion* of cast. I would like an expression of opinion from others on this point.

DISCUSSION.

DR. GODDARD: I am very glad indeed to hear this paper. This distinction in terms is practically the same that I made during my lectures on the subject of prosthetic dentistry some years ago. If

it is in order, I should like to move that this Association approve of this definition of terms.

[The motion was seconded.]

DR. GUILFORD: I happen to be one of those who have examined into this subject very carefully. I understand exactly the idea of Dr. Goddard and others who hold that view. The Committee on Nomenclature thought it was better not to use several terms when you could make one term answer. In this matter of terminology you cannot always get a word to express precisely what you wish. It is almost impossible. To avoid that or because of that, one word is used in two senses and two words are used for one thing, which results in confusion. Dr. Walker speaks of what a sculptor has said. There is this difference between the sculptor's work and ours. The sculptor takes a piece of clay and models it to the form he wants,—a human face or anything else. Afterward he covers it with plaster in sections and makes what he calls a mold. That mold is taken, prepared, put together, and plaster poured into it, which makes what is called a cast or a reproduction of the original idea in clay. The result in plaster is called a cast. They do not call it a model, because they have no use for it as a model, except in this way: If they wish to use the plaster cast afterward for reproduction in plaster it would be a model to be copied. We do not perform that kind of work. We have one article here, and the only difference between it in one condition and in another is that one is perhaps half or three-quarters of an inch high, and the other an inch and a half or an inch and three-quarters. You call one a cast and the other a model. It does not need any work to convert a cast into a model as it is defined here, except to make it a little deeper. It seems to me that there is not enough distinction between the two to warrant us in the use of two terms. I think it would be better to call both a cast or both a model. We want to simplify this matter. I have taught prosthetic dentistry for many years, and have never found in the student's mind the confusion between cast and model of which Dr. Walker speaks. I call it a model whether it is used for one thing or the other. It is not a model to be copied in the strict sense of the word in vulcanite work, but we call it that for convenience, and everybody understands what it is. For that reason I should prefer to hold to the plan adopted years ago of calling both models.

DR. MOLYNEAUX: I think if Dr. Walker will refer to the proceedings of the meeting held at Asbury Park, he will find published there substantially the paper of to-day. I made that as a part of my report. Dr. Guilford remembers very well that this subject of model and cast was brought up and I made the same distinction, and have been using it for some years. Dr. Libbey, of Pittsburg, was with me, and Dr. Guilford will remember that on the Coleman House porch we discussed this thing, and in the subsequent discussion before the American Association this whole ground was gone over. The same words used this morning were used then. You will find a report on the differentiation between cast and model, and what was published in my report is substantially what has been read here to-day. I wanted to separate the terms, having "cast" mean the plaster form which came from the impression used in vulcanite work, but if that was to be copied in metal, to call it a "model;" but if you will analyze the definitions in the Century and Standard Dictionaries, you will find that there really is no difference. Anything that is poured in a liquid state is a cast, or a casting, but a cast can become a model and a model may have been a cast. There is really no reason why we should use the two terms. I was compelled to separate the two terms to make a distinction where there is really no difference, and I was compelled to go back on my report, because I saw it was better to use one word, either "model" or "cast," without having a confusion of the two terms, because one will virtually answer. I simply wished to mention the fact that I did make that report which was published in the Transactions of that year, and if Dr. Walker refers to that he will find there pretty nearly the paper he has read to-day.

DR. WALKER: I do not claim any originality in this. I know that it has been recommended or proposed before, but it was never finally adopted. I was aware that some used the terms one way and some the other, and I thought it would be well to agree.

DR. GODDARD: I think there is a greater difference between "cast" and "model," as defined in this paper, than is stated by our friend, Dr. Guilford. It is a little more than a difference in thickness. I define a model as a cast so trimmed that it will drop readily from the sand. That is a model, to be reproduced in metal, and that reproduction is a die.

DR. BARRETT: It would seem as though the word "cast," when

used as a noun, should simply be the object, and not the subject, of the verb to cast. That is, we cast a cast. We do not cast a model. A model is constructed by manipulation of the fingers, but a cast is mechanically made by the crystallization of some fluid, or semi-fluid, or colloid substance within an impression previously obtained. And yet I am not prepared to vote intelligently upon this without sufficient thought. We are supposed now to be establishing history and nomenclature for all future ages. I am not prepared on such snap-shots as these to attempt to make the interpretation for all the world and for all the philologists who may exist in the world.

DR. MOLYNEAUX: I was a member of the committee which very carefully prepared that report. It was not adopted in any real sense of the term. The report was a recommendation, and it has never received a single word of either commendation or rejection by anybody. My part of the report, authorizing the use of the two words "cast" and "model," stands and has never been taken up. I think that report could well have had more attention than it received. It was only published for the consideration of the body, and there should have been a later report as to whether these terms should be adopted or rejected.

DR. BARRETT: Has the report been adopted?

THE PRESIDENT: No, it has not.

DR. BARRETT: Has it been accepted?

THE PRESIDENT: It was accepted when it was read.

DR. BARRETT: I move the reference of the report to the Publication Committee, and the reference of the recommendations in the report back to the Committee for another year, in order that it may have further consideration.

THE PRESIDENT: The motion is that the Association express its approval.

DR. BARRETT: I move as an amendment that the recommendations be referred back to the Committee for another year, that we may not take precipitate action.

THE PRESIDENT: The Chair would rule that you must pass upon the motion of Dr. Goddard.

DR. BARRETT: According to all parliamentary rules, we have a right to amend the proposition.

DR. GODDARD: I am entirely in favor of referring this matter

to a committee for action next year, and for that purpose I will withdraw my motion.

THE PRESIDENT: With the consent of the second, the motion will be withdrawn, and now the paper is simply with the others that have been read, no disposition having been made of it.

DR. BARRETT: I move the reference of the recommendation back to the Section for consideration another year, and that it be reported upon at the next annual meeting.

THE PRESIDENT: Did the Committee make any recommendation in the paper?

DR. WALKER: Not at all.

THE PRESIDENT: There is no question before the house, except the discussion of the paper.

DR. MCKELLOPS: I think the motion of Dr. Barrett is strictly in order,—to refer it back. I do not think the President has any authority to shut it out. I think we have a right to refer anything back that we want to.

THE PRESIDENT: You may dispose of the paper now just as you please. If you want to send it back to the Committee, that is in order. This was not a recommendation of the Committee. It is only an opinion expressed in the paper.

DR. BARRETT: I ask the privilege of withdrawing my motion.

DR. WEEKS: I move that the recommendation in the paper or the point covered in the paper be referred to the Section.

[The motion was agreed to.]

DR. WALKER: As the weather is very warm and as this other paper of mine is somewhat lengthy, I have just secured the permission of the Chairman of the Section to withdraw it. I think it would be referred to the Committee as this other one was. The Section, I think, should have recommended something; as they did not for the first paper and as the second paper would simply be referred, I will ask to withdraw it now.

DR. TAFT: Let it be read by title and placed in the hands of the Publication Committee.

DR. WALKER: I would rather not. I would prefer to keep it.

On motion, Dr. Walker's request to withdraw the second paper was agreed to.

SECTION III.

Operative Dentistry.

REPORT BY J. Y. CRAWFORD, CHAIRMAN OF THE SECTION.

SECTION III, Operative Dentistry, reports one paper by Dr. B. Holly Smith, Baltimore, on "Removal of the Dental Pulp."

The Section has not been able to procure papers for the meeting, but has attempted to organize sectional work.

We held one meeting yesterday afternoon for two hours, at which some considerable detail discussion was had with much profit.

Your Chairman and Secretary recommend the encouragement of the development of this Section, as it has perhaps the largest element to draw from in our Association.

J. Y. CRAWFORD, *Chairman.*
FRANK HOLLAND, *Secretary.*

SECTION III.—Continued.

Removal of the Dental Pulp.

PAPER BY B. HOLLY SMITH, OF THE SECTION.

THOSE familiar with the history of the healing art will consent to the proposition that in the proportion that medicine has grown scientific and skillful has less dependence been placed in the therapeutic effects of drugs for the alleviation of human ills. Thirty years ago it was no uncommon thing for a patient to be salivated with mercury and deafened by quinin administered for the relief of a slight attack of malarial fever. The salivation and loss of hearing incident to the treatment cut little figure with the physician. Like his prototype who made a specialty of fits and assaulted his patient with hammer and tongs with an eye single to the relief of the condition, his vigorous onslaught upon the disease absorbed his whole effort, and the fact that the subject might emerge from this Midshipman Easy triangular duel between the mercury, quinin, and malaria toothless and deaf was regarded as one of the idiosyncrasies of the human physique for which the doctor was in no way responsible.

That these exhibitions are less frequent to-day is due not to the fact that these drugs have lost their anti-malarial efficacy, but to the data furnished by the scientific investigators of the pathological action of drugs. Secondary effect has assumed greater importance, and possible evils attending administrations have outweighed the advantage of immediate relief.

The practitioners of the specialty of dentistry for more than half a century (since the introduction of arsenic into the profession by Spooner in 1836) have resorted to the application of arsenious acid to the dental pulp with a view to its destruction. For years the teaching was that the arsenic should not remain in the tooth-

cavity longer than twenty-four hours; but of late it is not uncommon to leave it sealed in for two weeks, and many do not disturb it until disintegration of the pulp has taken place.

We are told that it is not necessary to expose the pulp to make the application effective, that the arsenic will penetrate the dentinal tubuli, and the pulp-destruction will be accomplished painlessly. Indeed, so penetrating are we led to believe this agent to be that a recent writer has claimed that teeth to be crowned should have their pulps destroyed and removed, as the slight amount of arsenic contained in the cements with which the crown is set probably will cause pulp-destruction.

Has any one found the exact limits of the destructive power of this agent? Is it a fact that this treatment, which has persisted so many years with little modification, has been attended with no secondary evils?

It becomes a very difficult matter from a clinical standpoint to answer these questions without fear of contradiction. That pericemental disturbances do frequently occur can be stated without dispute. That arsenic may be the cause of it has long been the thought of the writer. This opinion has been formed through observation of the contrast between pulpless teeth made so by surgical procedure pure and simple, and those from which the pulps have been removed after the application of arsenical preparations, this observation covering a period of sixteen years. During this period I have yet to see a case of pericemental inflammation or abscess where the pulp has been removed without resort to the use of arsenic. The contention has been that where pericemental disturbances occur in teeth in which the pulps have been destroyed by arsenic, it is the result of faulty technique or failure to operate under proper aseptic conditions. We think this assumption untenable, in view of the fact that skilled, clean, and careful operators have not been able to establish any record which does not indicate cases of apical or pericemental trouble, in spite of reasonable precautions.

If, as has been stated, arsenic will destroy the dental pulp by an extension of its action through the dentinal tubuli, it cannot be disputed that its fatal effects upon that organ must also embrace the contents of the dentinal tubuli throughout the tooth. The well-known germicidal qualities of arsenic, together with the fact

that it has been used successfully as the chief ingredient of embalming fluids, would indicate that no trouble should be expected from the contents of these tubuli when they have been subjected to the arsenical application and securely sealed from the chance of subsequent infection. Indeed, it would seem that the contents of the pulp-canal and tubuli while directly under the influence of the arsenic would offer a very poor field for infection; and it seldom happens even in careless hands that immediate unfavorable results follow. The contents of these tubuli, shut off from outward infection, separated from the circulation and under the embalming influence of the arsenic, would seem to offer no menace to the health of the tooth, even though the apex were imperfectly sealed; yet trouble not infrequently does arise in after-years, even when the operator has been reasonably certain that the apex was entirely closed.

Why? Is it possible that a sleeping volcano has been located in the apical space by the application of arsenic, that the effect of the agent has not been limited to the confines of the root-canal and dentinal tubuli, that the area of tissue affected breaks down in seasons of depressed vitality, or becomes infected through the medium of the circulation? Why should the arsenic affect only the contents of the root-canal and dentinal tubuli? The apical opening may be infinitesimal, but it must of necessity be large in comparison with the tubuli in the dentin. Why may not the nerves and vessels in the apical space and a considerable area of the pericemental membrane have a share in the action of the arsenic?

There is no positive evidence of a well-defined line of demarkation in the effect; even after the agent passes the point where it has power to destroy, may it not deplete and incapacitate the tissues, until disaster is invited and may subsequently occur?

The most doughty and enthusiastic advocate of arsenious acid, Dr. J. Foster Flagg (in the *Dental Cosmos* for July, 1877), says, "It is the almost universal experience that after an arsenical application has remained in a tooth for several days soreness of the organ supervenes; a tenderness upon occlusion; slight pain from striking, etc., all indications, apparently, of peridental difficulty; but these same symptoms are concomitant with the dying of the last portion of pulp, no matter from what cause, and if a pulp be

extirpated during the existence of this condition it will, under the microscope, present an appearance which will clearly indicate the reason for such tenderness, in the evident absence of vitality in the greater portion of tissue, and the equally evident presence of high inflammation in that portion immediately contiguous to the apical foramen." If this state of inflammation occurs in every case with the dying of the pulp, why is it not better that it be extirpated under the influence of an anesthetic?

Arkövy indicates that the agent is quickly taken up into the blood-vessels, no coagulation of tissue whatever occurring. He says, "It has a specific influence upon the blood-corpuscles, combining with the hemoglobin to form a compound of arsen-hemoglobin. In nearly every case it is taken up *in substantia* (in the form of molecules) into the blood-ways; when there it produces, besides the above-mentioned changes, granular detritus of the contents. The nuclei in the neurilemma are somewhat increased, granular destruction of the myelin, and here and there the disappearance of the axis-cylinder occur."

Dr. Burchard, in his recently published "Dental Pathology and Therapeutics," says, "The indication is, that a minute portion of the arsenic is taken into the pulp; this may be either through the odontoblastic processes in cases of non-exposed pulps, or, when exposed, by the cells themselves, and causes violent reaction of the vessel-walls, which dilate to their utmost; extravasation of corpuscles occurs and circulation is checked at the end of the route, the pulp-vessels are mechanically occluded, so that no absorbed arsenic is carried beyond the pulp extremity. The arsenic exercises its paralysant and degenerative influence upon the nerves of the pulp, after first inducing a violent irritation, which may be due to the specific action of the arsenic upon the nerves or to the intense hyperemia. The strangulation theory cannot, however, hold in all cases, for progressive death of structures free to expand occurs after application of arsenic, so that the specific and gradual action of the poison must be the important factor. Strangulation would imply an always sudden death of the pulp *en masse*, which evidently does not always occur, for complete death of the organ may be gradual and require several days. In other cases repeated applications may be necessary."

The claim that an insuperable barrier is erected at the apex of

the tooth would indicate that it is a matter of indifference as to the quantity of arsenic applied. The inflammatory process will "mechanically occlude" the vessels so that no arsenic will pass this point. Yet the editor of the *International Dental Journal*, who should be an authority upon such matters, severely censures Dr. Burchard for failing to give emphasis to the necessity of using only minute particles of this "dangerous agent."

In a paper read before the joint meeting of the American and Southern Dental Associations, in 1888 Dr. I. P. Wilson, the author, states, "The devitalization of the dental pulp should not, and usually does not, interfere with the vitality of the cementum; but from observations I have made from time to time I am led to believe that the life of the apical portion of the cementum, or that part not separated from the pulp by dentin, is sometimes destroyed with the pulp, resulting in necrosis, and ultimately in absorption or the solution of the lime-salts of the tissue of the end of the roots. We will almost always find this to be true in those cases where the canals have been filled for a considerable length of time, and yet there has continued to be a tenderness on percussion, and, indeed, the tooth will remain slightly sore the greater part of the time, but the sensitiveness experienced is that of uneasiness rather than that of real pain. This state of affairs is brought about by one of two causes: either the canal has not been filled perfectly to the apex, or the devitalizing effects of arsenic have been communicated through the canaliculi to the lacunæ, thereby leaving this portion of the cementum dead and inert."

Dr. Kirk, in a recently published paper (*Dental Cosmos*, August, 1898), says, "Broadly considered, any inflammatory action is a disturbance of the normal processes of nutrition, and this is true of both general and local inflammations, the disturbance being proportioned to the intensity of the irritative action. Where bacteria and their products are the excitants of the inflammation, their effective invasion is conditional upon the vital status of the tissue concerned. If the vital resistance of the tissue is sufficiently high it becomes immune, and bacterial invasion is impossible. The vital potential of a tissue is the result of the sum total of its nutritive processes normally performed. Any interference with the normal nutritive process therefore results in a diminution of the vital potential of a tissue, and renders it liable to invasion by bacteria

with consequently inflammatory reaction. A disturbance of normal nutrition resulting in lowered vital resistance is therefore a precedent condition to effective bacterial invasion."

This is exactly what we may expect of the remote effects of arsenic, to lower vital tone, disturb nutrition, and by so doing invite infection. It is not claimed that any extended amount of tissue beyond the apex is as profoundly impressed as the pulp-structure, for if such were the case immediate expression of this pathological condition would ensue. The records of surgery furnish abundant evidence of encysted areas which subsequently break down and become infected through the circulation. This we believe is the rational explanation of pathological expressions occurring in the apical space of teeth which have been treated with arsenic.

If the suspicions which have been aroused in the mind of the writer have any foundation in fact, and if he has correctly interpreted his clinical experience, arsenic should no longer enjoy its universal popularity, but should give place to surgical procedure.

Ten years ago this would have been more difficult than it is to-day, and the difficulty to-day involves not so much the absence of other means, but aversion to a change of practice and the well-fixed habit which has fastened itself upon the profession of treating teeth for which no charge is made. Some of our best operators will assign two hours to a patient to fill a tooth with gold, and five minutes in which to destroy a pulp. If we can justly claim to be dental surgeons and not mere cavity-stoppers, this is not right and must be changed. One or two hours is not too long for the removal of a dental pulp, and a fee of ten or twenty-five dollars is not too much to charge for its accomplishment.

In view of what is generally known and has been recently written upon the subject of pulp-removal, it might seem unnecessary to describe methods which may be substituted for the arsenical treatment; but having called attention to the suspicion which I think should attach to the latter agent, I will as a matter of sequence outline a practice which does not involve its use, and from which, I feel certain, less baneful results will follow.

The first consideration of the surgeon is the necessity of operative procedure; second, that the patient and field of operation are in as favorable condition as can be obtained. These general considerations are not to be overlooked by the dental surgeon. No

effort should be made to remove a dental pulp in a high state of inflammation. Antiphlogistic agents must be used until the irritation with its consequent dilatation of vessels has subsided.

My custom has been to flood the cavity with tepid solution of bicarbonate of soda; the cavity is then closed with a pledget of cotton saturated in cocain hydrochlorate for a few moments, care being taken not to allow any pressure to defeat the object of the application. If any excess of *débris* or accumulation of leathery decay is found in the cavity an effort is made to remove enough of it to gain access for subsequent applications to the pulp, not entirely uncovering that organ, however. Great care is taken not to cause any pain, for at the outset the patient has been assured that the treatment may take time and patience, but is to cause no pain. To break this promise at any time would be unfortunate, but to do so in the initial treatment would be suicidal to the confidence so essential to success.

A concave disk of vacuum cavity material, made by driving the reverse or butt end of an excavator into a sheet of the metal held on a lead or wooden block, is now adjusted to the cavity so that its edges will impinge upon the walls and prevent pressure. Under this disk a pledget of cotton saturated with oil of cloves is placed, the whole then being covered with temporary stopping. The gum over the affected tooth is painted with aconite and iodin in equal parts, and the patient dismissed until one or preferably two hours can be reserved for the operation. If pain has ceased and the excessive irritability subsided when the patient reappears, the pulp is cocainized with the electric current and removed. Here we will have to proceed cautiously, but the reward is in sight. Why should we not have patience? My practice is to use a minimum amount of current and a saturated solution of cocain. I have heard complaints of occasional failure of cataphoresis. A surgeon is full of resources: If cataphoresis is not successful in the fullest sense, it may be supplemented by injection or by the administration of a general anesthetic, preferably nitrous oxid gas. In all cases where teeth containing living pulps are to be excised or ground down, advantage is taken of the opportunity to remove the pulp under the influence of the shock of the excision. This can be done with no pain whatever, the apprehension of the patient being lessened by cutting the enamel with disks or burs, leaving only so

much to be excised with the forceps as will not require any great stress or violence. A cone-shaped bur of suitable size is ready in the engine, clean and sharp; broach, etc., are to be ready, for the entire pulp must be removed instantly. The bur may not be necessary, but if the pulp is not freely exposed the bur should be plunged into the canal, the ragged orifice enlarged, and the pulp broken up. The broach is now passed quickly to the apex and the pulp twisted out in toto. It is needless to say that surgery finds its most inviting field in the single-rooted teeth. Success can be attained, however, with the molars as well, if the effort is painstaking. Surgery is not only more scientific, but when it is proven to be more successful a plea for this alteration of our methods of practice should not be unheeded.

DISCUSSION.

DR. BARRETT: This is a subject which has never been cleared up entirely. We do not to-day know the precise action of arsenic upon tissues. If I apprehend the paper aright, it assumes that the death of the pulp is due to the action of the arsenic upon the nerve-tissues. I do not understand that that is the case. We know that arsenic is a corrosive poison. We know that it induces the breaking down of connective tissue, not alone in the pulp, but in any other tissue. It will even bring about necrosed conditions of osseous tissue. It has a dynamic power aside from its mere union with the tissue itself. If it were a fact that at the apical foramen of the tooth there was such congestion as to cause stasis through the constriction, that would account at once for the death of the pulp; but it would not account for the death of the pulp in cases when no such phenomenon is apparent. Another thing, you are but too well aware of the fact, some of you, that if it be not sealed up carefully within the cavity of the tooth when so applied, but allowed to come in contact with buccal tissue, it is just as fatal to buccal as to pulp-tissue. Hence, there must be something besides its effect upon nerve-tissue, and I believe it has some dynamic power. Being a corrosive poison, it induces the most extraordinary changes within a comparatively short time. I have a number of preparations of pulps under the action of arsenious acid in which the capillaries are engorged and congested to their utmost, just up to the point of stasis. And finally, when there shall have come

through the corrosive action such a change in the vascular walls of the blood-vessels as to cause stasis within them, which is death,—for stasis is death,—the subsequent changes that take place are not due to arsenious acid, but are due to something else.

I believe there is something more to report in reference to this subject, which will be considered in the report of Section VII, and I have here anticipated a little of what is to be said in that Section. I desired to present that single point at this time in order to open the discussion.

DR. HUNGERFORD: I wish to say that it seems to me that the spirit of the paper did not relate so much to the pathological conditions as to the rationale between the use of chemicals and the use of physics, between the use of therapeutic agents and the use of surgery. That was the key-note of the paper, and though I might differ with its author in the method of applying those physics, though I might differ in the surgical procedure, yet I am heartily in accord with the disuse of the empirical method of applying therapeutics to the blood-stream or to the part locally to produce the effect. I will say that in my own practice, at least for the past two and a half or three years, I have not used arsenious acid in over five per cent. of the cases. Fully ninety-five per cent. of the cases have been treated surgically, varying according to their locality, the character of the inflammation, their position, the idiosyncrasies of the patient, and so forth. I just wish to indorse the paper as a whole, though I would differ from it in a special treatment. It did seem to me that Dr. Barrett slightly mistook the character of some of the speaker's remarks in supposing that it was due to a stasis of the blood-stream within the pulp-chamber and pulp-canals. For years I have pulled out pulps after the application of arsenic for a day or two, and have found the pulp completely disorganized and broken down in the pulp-chamber and perhaps half-way down the canal, yet have found perfectly healthy tissue, or at least apparently healthy, toward the apical foramen. It was clear white, apparently not congested, and it could not have been that the pulp was congested in the pulp-chamber by a congestion that had taken place at the apical foramen.

DR. PATTERSON: I am very much interested in the paper, and I only wish to mention one point that was spoken of in the meeting

of the Section, in regard to pericemental inflammation after extirpation of pulps; that I have gotten rid of that trouble of which Dr. Smith has so ably spoken by removing the pulp in a surgical manner. I do not feel competent to speak of this so well as some of my friends. My good friend Dr. Hungerford has for years endeavored to convert me to this method which he has been using, but my conversion has been so very recent that I do not feel fully authorized to speak about it; but from the experience that I have had in the last three months I am moved to say that I shall never again introduce arsenic into a tooth in the anterior part of the mouth for pulp-extirpation. That is what I want to speak of, the getting rid of all this pericemental irritation following the application of arsenic. Then all the irritation will be that which is produced by the introduction of toxic matter with the instruments used in the surgical operation. That is not a patented method at all. It has been done for years by Dr. Hungerford and others, and recently by myself. If the pulp is congested and in a state of inflammation, the first thing to do is to isolate the tooth with the rubber-dam, protect the lips and cheeks with napkins or by other methods, using the chlorid of ethyl congealing process, giving you a chance to open into the tooth. The idea is to do this without pain, and after you get entrance to the pulp, using cocain in the manner in which I do it, you can reach the end of any pulp.

The objection to the chlorid of ethyl is the shock of freezing. With care and a little time there is no difficulty about that. You protect your sensitive pulp-cavity with cotton until the freezing process partially takes place, and then take the cotton out, and then apply the chlorid of ethyl for a few moments longer, using perhaps a fourth of the usual bottle or less than that. Take your bur and open immediately into the pulp without pain. If it is congealed perfectly, you should have no trouble at all, and then, after the pulp is entered, use crystals of cocain finely pulverized. Do not use your cocain in large grains, but finely pulverized, gathering it up on cotton as large as you can get into the cavity and then using pressure. I do not care if you do it with punk or do it with cotton, but the better way is to force it, and this forcing is done before the tooth recovers from the freezing with chlorid of ethyl. I use a piece of black vulcanizable rubber because it is more plastic, taking a piece suitable to the size of the cavity, beginning by applying the

force gently, and after a few moments you can use all the force you please. My experience with the method of introducing cocain into the pulp by injections or by instruments without this forcing process is that they are worthless; but with this tampon—I do not care what you make it of—you can, in the majority of cases, if you have ready access to the pulp, force in the cocain so that in three or four minutes the pulp can be removed absolutely without pain. If you have to use it again after removing a portion of the pulp, then do so. I have been more than charmed and pleased with this process, to the use of which I have been converted by my friend Dr. Hungerford, and I can testify for him, as I believe I can testify for myself, that no practitioner in our bailiwick removes a greater number of pulps than we, sometimes many in a day, and by this method we get rid of all this trouble which does not always come, but which is likely to come with the application of arsenic. Of course the treatment of putrid canals is a different thing. I have used this method of pulp-destruction as far back as the second molar, where the cavity was convenient for this operation. Of course in the case of second molars and wisdom-teeth I still use arsenic in many cases, but my experience in the past few months has been such that I do not think I shall ever again use arsenic in any form or manner in the extirpation of a pulp of ready approach.

DR. B. HOLLY SMITH: The paper which I have read was intended principally to be a record of clinical experience. The descriptions of the pathological effect of the agent were not mine, but those descriptions which have been accepted by the profession, and I did desire, as a supplement to the paper, to present some record of these clinical cases. I feel that the time is not opportune, and I shall continue the study of this subject and wait for a more convenient occasion.

In reference to the pathology of the subject, I feel satisfied that I am not wrong. I have a letter in my hand from as high an authority on pathology as we have in this country, Professor William H. Welch, of Johns Hopkins University. I wrote to Dr. Welch to see if he could help me perform some experiments upon the teeth of animals, injecting those teeth with arsenical preparations and examining the tissues in the apical space after the effect of the arsenic had been expended upon the pulp, to see whether any variation from the normal condition existed as a result of the

application of the arsenic. Dr. Welch wrote that he thought it hardly practicable, or at least a matter of very great difficulty, and on account of the hot summer and the absence of some of his assistants he was obliged to postpone that for the present, but that probably this winter he might take it up. And in that letter he says,—

"Your line of argument as to the possibility of unfavorable remote consequences of applying arsenious acid to tooth-pulps appears to me entirely correct and based upon sound pathology; but I believe that clinical experience in this matter is worth more than anything to be derived from animal experiments. Very sincerely,

"WILLIAM H. WELCH."

DR. JACKSON: Several methods have been presented of producing anesthesia for destroying the pulp. I should like to call attention to the method of pressing cocain in solution against the pulp, as being a very excellent one. That is, take a pellet of cotton, moistened with cocain solution, and place it over the exposed pulp, and then press a piece of soft rubber into the cavity. I want to say that Dr. J. Y. Crawford, our present Chairman of the Section, described this method to me in my office about four years ago, and I have used it many times. I find that I can produce strangulation and numbness in the same manner, using water without the cocain. I also employ the method of injecting a very weak solution of cocain and salt under the mucous membrane over the root of the tooth and go right into the cavity without any special preparation, and take out the pulp. This is done in a few moments. A four per cent. solution of common salt also is efficacious in some cases in producing anesthesia. With these methods I have had very excellent results, and usually with no pain.

DR. TAFT: I am gratified with this paper and the expressions we have heard with reference to this subject. This has been a subject of great interest to me for many years, and I have many times regretted that there seemed to be an indisposition to consider it on its merit and free from prejudice. This method of destroying tooth-pulps was almost universal in the profession until within a few years; that is, by arsenious acid. More than twenty years ago I had the experience that is now being described by others, such an experience as led me to abandon the use of arsenic for this purpose; so that during this time my practice has been to remove the pulps when necessary by some method other than by the use

of an agent not only destructive to the pulp but in many instances highly injurious to other tissues about it, which rendered its use very objectionable. It has been admitted all along that in many instances there will be injury to the surrounding parts by the use of this agent, with which you are all familiar, and which has been so graphically described in the paper just read. But while that was the fact in some instances, yet in other cases there was such an indisposition to abandon this agent that the reply is generally made, "Oh, well, it is only now and again that this injurious effect appears, and so, because in many instances its use is successful, we will continue it." But it would seem that with the improved and less dangerous methods of removing living pulps from the teeth, methods many of which are so efficient, there is no longer any excuse for any operator using arsenic for this purpose. I have pressed this matter upon the profession wherever opportunity has occurred, and sometimes, perhaps, where it ought not to have been pressed; but I do consider it a very vital point, and that this method, which I consider is always objectionable and liable to do injury, ought to be wholly abandoned. Our colleges in their instructions ought to take the right ground with regard to this matter. Students ought to be cautioned against this agent, and so taught that it should be ruled out of the list of agents for this purpose. There are several valuable materials and methods for destroying tooth-pulps that will leave no after evil results.

The use of cocain has been referred to. This is a very good agent for this purpose indeed. I was gratified to hear Dr. Patterson say that the cocain ought to be pulverized finely and then that some pressure should be applied to it. When pulverized, it is more readily soluble. It must be dissolved before it is taken into the pulp, and the object is very readily accomplished in that way. The powder should remain on the pulp for a few moments. Even a four to six per cent. solution of cocain injected into the pulp is very efficient. It should not be injected into the gum-tissue around the tooth, but into the pulp itself. The absorption of the cocain in solution and the gradual injection into the pulp with a hypodermic syringe will completely anesthetize the pulp so that it may be removed absolutely without pain. This method has been in use for four years perhaps. So far as I know, the first use of it was by Dr. Hoff, of Ann Arbor, whom you all know. It was

immediately taken up by others and found to be good. The fact must be taken into account, however, in all these operations that there is a difference of susceptibility in different cases. Some are far more sensitive than others. Some respond far more readily to anesthetizing influences than others, and a just discrimination is requisite in order to obtain the best results in this kind of practice as well as in all others. We must not proceed as though all cases were alike susceptible and all alike responsive.

You are aware that sometimes arsenious acid must be applied to a pulp two or three times before complete devitalization is effected, while in other instances the smallest perceptible amount, brought in contact with the tissue, will destroy its vitality in a few hours. That depends upon the resistance of the tissue to its action.

As was suggested a few moments ago, I have seen many cases in which, after the use of arsenious acid, a portion of the pulp of the tooth would be devitalized,—that in the pulp-chamber,—and the portion in the root would be seemingly untouched, and I have seen cases where these remains of pulp in canals were sealed up and continued for months to have a lingering vitality, showing that they had not been subjected to the destructive influence of the agent. A great resistance, therefore, exists in some cases. I remember one case in which I applied arsenious acid to a pulp fully exposed in a molar tooth, applied it daily for five days, and the pulp at the end of the five days apparently was a living, healthy pulp, seemingly in as good condition as when the application was first made, and that pulp was living several years afterward. This simply shows the difference in susceptibility in different cases.

Another point is that when the pulp of a tooth, removed without arsenic or any other poisonous irritant having been used, and before suppuration or disintegration has taken place, is in the best possible condition to be permanently closed or filled; after hemorrhage has ceased, there is no need for further treatment. But it is said, "Would it not be better to apply some antiseptic treatment at the time and then have it filled?" I can hardly see the reason for that, because if the canal is well closed, hermetically sealed, there will be no more liability to a change adverse to the welfare of the tooth taking place than there would be in any other tissue of the body. I am gratified that this subject is receiving more thorough consideration than in the past.

DR. WATKINS: I want to thank Dr. Smith for this paper which he has given us this morning, and I want to congratulate the Association on receiving it. It is one which is practical in every sense, and one which I think will do all of us good. It has brought out points in which we are all interested.

There is just one point of which I want to speak, and that is in regard to removing the pulp. I have many times applied the chlorid of ethyl. In fact, I have two lines of practice which I use in connection with chlorid of ethyl for removing pulps. I freeze the tooth, as Dr. Patterson has described, open the cavity with a large bur so that I have free access, and then with a long, sharp, small point immediately punch the pulp out without any pain, giving it a twist and drawing it out cleanly.

But if there is sensitiveness there, I inject cocain with a hypodermic syringe and then remove the pulp with a broach, which can be done in any of the anterior teeth almost instantly, the whole operation only taking, perhaps, a couple of minutes. Then the work is done, and the tooth is in good condition to fill without the application of arsenic.

DR. BARRETT: I wish I had the skill to introduce a hypodermic syringe point into the pulp of every tooth that I find requires devitalization. I cannot do it. I cannot twist it around and get it behind a molar, and I cannot get it into an infinitesimal opening when the pulp is so exceedingly sensitive that I cannot enlarge the opening. I wish somebody would teach me.

Another point is this: You condemn the use of arsenic as a dangerous agent, and recommend cocain. Which is the more dangerous? Which is the more treacherous? Upon which can you put the greatest reliance, and upon which can you use preventive or curative measures with the most positive results? For myself, I am ten times as much afraid of cocain as I am of arsenic, for arsenic intelligently employed has never to my knowledge gone beyond the apex of a tooth, while cocain has caused incalculable damage, often without the ability to counteract or to prevent its injurious effects. I believe that the use of cocain to avoid the use of arsenic, because of the dangers which may arise from the use of the latter, is jumping from the frying-pan directly into the fire.

DR. B. HOLLY SMITH: I simply want to refer Dr. Barrett to the oculist, who uses cocain with impunity for operations about

the eye, where he would not consider it feasible to use arsenic in the most infinitesimal quantity.

DR. BARRETT: The oculist does not usually hypodermically inject cocain into the tissues. He uses it topically. Besides, every surgeon who uses cocain frequently expects to have its poisonous influence. He simply takes the chances upon it because it is an absolute necessity, and he trusts to his ability to counteract it. He knows he can counteract arsenic. I am not defending the idea of shoveling a spoonful of arsenic into a cavity; I am supposing an intelligent use of it.

DR. PEIRCE: I desire to emphasize a remark made by my friend Dr. Jackson. It has not been noticed, and therefore I imagine has not been appreciated. Dr. Jackson spoke of an injection of salt and water. I do not think the profession generally know and appreciate the advantage of an injection of salt and water around a tooth for alleviating the sensibility of dentin or the sensibility of a pulp. It is invaluable in my hands. Two or three injections of this solution around the root of a tooth will relieve intense sensibility of the dentin. It will also relieve severe irritation of the pulp, which comes on sometimes from the application of arsenic.

Often instead of salt and water I use for a local application electrozone. I have never found any article that could be applied directly to an inflamed pulp which was giving great suffering that caused the instantaneous relief given by an application of meditrina or electrozone. I have no hesitation in saying that it is the most admirable in its results of anything we can apply to a pulp in that condition of inflammation.

DR. WATKINS: A hypodermic application?

DR. PEIRCE: No, I speak now of a pulp that is exposed, which has been inflamed by the application of arsenious paste—a local application on cotton. Arsenic applied to an inflamed pulp in many cases does not devitalize it. You may make the application three or four times, and if the pulp is inflamed it has little effect except upon the surface with which it comes directly in contact, where it acts as a caustic. It is not absorbed. To have the happy effect of arsenical paste upon a pulp, that pulp must be free from inflammation. That gives the best result. But if you gentlemen will try the experiment of injecting simply salt and water in the gum around the root of a tooth, you will sometimes be able to

abort an incipient abscess and also to relieve the patient of considerable suffering when you are operating upon pulp and dentin.

DR. HILLMAN: I should like to ask Dr. Peirce if he uses meditrina in a strong solution for injecting into the teeth.

DR. PEIRCE: I did not speak of injecting meditrina into the tissues. I spoke of applying it locally to an exposed pulp. I use a strong solution, a saturated solution nearly of salt and water. I think it is harmless. I have never had any ill results from it.

DR. HUNGERFORD: I have just one more word to say in answer to Dr. Barrett. He says he cannot use a hypodermic syringe upon back teeth, that he cannot get syringes made small enough. I am right with him there. Where we have a great big cavity and a great big pulp-chamber in an anterior tooth, there is no necessity for a hypodermic injection, and when a gentleman commences to contaminate the blood-stream of a patient by hypodermic injections, he reminds me of the fact that the rattlesnake was the first one that took out a patent on the hypodermic injection. We have no business to contaminate the blood-stream by injecting salt and water or cocain or any other agent that is liable to contain micro-organic matter that is going to be carried into the blood-stream. It is folly for us, and it is a retrograde movement from what was advocated in the paper of Dr. Smith. We do not want to inject into the blood-stream agents that are going to affect the entire organism for the sake of obtaining local anesthesia. The agent spoken of by Dr. Taft, Dr. Barrett, and Dr. Smith will accomplish the result and will not bring the consequences that Dr. Barrett spoke about. He said, use this thing intelligently. Who ever heard of cocain producing a detrimental constitutional effect when applied to a tooth? Applied hypodermically of course it does. If he will apply cocain rationally, with a little common-sense, the same as he does his arsenic, he will never have any trouble with it.

DR. GUILFORD: In removing pulps from teeth I have in many cases employed another method without fear of any deleterious results whatever.

It sometimes becomes necessary to relieve acute pain in the pulp of a tooth when all ordinary methods fail. Some fifteen years ago a physician came to me who had had inflammation of the pulp for about a week. He was not a patient of mine, and the tooth had been treated in order to relieve the pain, but the dentist had

not succeeded, and finally, yielding to the solicitation of the patient, he had attempted to extract it. The result was the fracture of the crown, leaving the three roots in place and the bulbous portion of the pulp hanging down, and so tender that it could not be touched. He came to me and wanted to know if I could give him relief quickly. I thought a moment, and it occurred to me that inasmuch as a bur would often pick up a piece of cotton or paper and wrap it around it, it would probably do the same with the pulp. I placed a good-sized bur in my engine, anesthetized the patient, applied the bur to the exposed pulp, and instantly it was wrapped around it and taken out without any pain, and, of course, without any deleterious result. I would not claim this operation as being the best one, but it is a good one when you wish to remove a pulp or a portion of a pulp for the immediate relief of pain.

DR. CRAWFORD: I am very much gratified at the paper of Dr. Smith, and I have certainly been very much gratified at the discussion we have had to-day. Many years ago, in the mountains of East Tennessee, in a little district dental society, I called attention to the utilizing of the idea that seems to be most prominent here to-day, to wit, the conversion of the tooth into its own executioner. I suggested the method to a friend of mine, Dr. Billmeyer, of Chattanooga, and he went home and utilized the method and worked it up, and you will find it described in the proceedings of the Tennessee State Dental Society. Dr. Jackson complimented me by saying that I had called his attention several years ago to the method to which he referred. A point which I wish to emphasize is that in the removal of pulps from molar teeth and all other teeth that have more than one root, in our efforts to inject or to anesthetize by any of the means suggested, we usually succeed in anesthetizing in our first effort the most accessible root, from which we are able to remove its contents without pain. We should then stop, and afford a barrier to toxic invasion by temporarily corking up such root or roots before attempting to anesthetize the pulps in the remaining roots. We thereby remove the liability of the passage through the apical foramen of any agents which may set up inflammatory disturbance. I am very glad to see my profession coming around to the idea of utilizing a tooth to be its own surgical executioner. It excels the introduction of agencies by the hypodermic syringe, using each canal as its own means of destruction.

SECTION V.

Materia Medica and Therapeutics.

REPORT BY J. S. CASSIDY, CHAIRMAN OF THE SECTION.

THERE have been no conspicuous discoveries in Dental Materia Medica since the last meeting of the American Dental Association, unless they have been presented within the last two months. When one has been interviewing whales in the Pacific, and stubbing his toes against the stars, and dodging geysers and things in the Rockies, and having other pleasant experiences in other places during that time, he should be excused for his lack of knowledge of any great recent developments in medical science.

A few preparations of correct formulæ, mainly of antiseptic quality, have been introduced, but the deluge of drugs of this kind, intended for application in dental practice, following the acceptance of the bacterial genesis of many oral diseases, has culminated in a strong tendency to ignore the very new remedies and, on the other hand, to investigate more thoroughly the virtues of those that have been already more or less known. There are several reasons why we are disposed thus to resume more intimate relations with the older drugs. Aside from some objectionable properties, they are comparatively simple in their chemical and therapeutic action, time-tried, and reliable; are non-secret, and most of them not even proprietary.

The newer introductions, however, just now are somewhat like the stranger locating in an old and therefore highly respectable community; unless he takes letters of recommendation to every important family in the neighborhood he is pretty sure to be

snubbed by some of them, and his position perhaps rendered uncomfortable by the stories they tell.

Formaldehyd (CH_2O) holds a similar questionable position in the estimation of a few authorities in our profession, although its respectability is well known and established as the active principle of the earth of ant-hills, which, from time immemorial, has been gathered by the people of continental Europe and used by them successfully as a local remedy in the domestic treatment of swellings, bruises, suppurating sores, abscesses, neuralgia, gouty and rheumatic pains, etc. This fact probably led to its introduction, a few years ago, to medical science in the forms in which we now receive it.

At the meeting at Old Point in '94 the writer had the privilege of describing this compound to the American Dental Association. The claims made for it at that time as a *combined* disinfectant, antiseptic, and germicide have been found by careful investigation to have been based on solid truth; at the same time we should remember that its irritant properties, without a corrective, render it rather unpleasant to use in the mouth. Some writers in the journals report cases of serious sloughing of the gums caused by formalin, even when diluted. Such accusations surely must have their influence in overcoming the good reputation it has acquired in other hands, and, although some of us must confess to have had no other than beneficial results by its use in all sorts of suitable cases, now that positive evidence has been submitted by reputable gentlemen of the injurious effects produced in the mouth by this agent we shall probably be less free with it than heretofore, for all our medicaments should be, "like Cæsar's wife, above suspicion." In order, however, to give the deserving a portion of its due, permit us to say that if extracted teeth intended for diagram work by the classes in our colleges be kept over night in a five per cent. solution of formalin they will be thereby completely sterilized; and, further, inasmuch as there is no method known which will destroy infectious matter on steel instruments, without injuring them, in less than ten minutes,—which is *too* long a time for patience to stand around smiling at grief,—we need something harmless and immediately effective; and if burs, excavators, etc., after cleansing, be dipped in full strength formalin, wiped dry, and scented with whatever you please, they will be more thoroughly

and safely sterilized than by any other conveniently available means; besides, the formalin can be used repeatedly in this way.

Dr. C. O. Edwards, of Oakland, Cal., assured the writer that twenty-five per cent. of formalin will prevent mercury from attacking gold.

The latest phase of Cataphoresis is the laudable effort of writers in our journals to instruct us in the definite rules of Electrolysis. Although it is rather ancient history, as may be seen by reference to the reports by this Section to the American Dental Association in '96 and '97, we may be pardoned for introducing here, merely, however, as a suggestion, a brief list of cataphoretics employed in dentistry, with their active principles so arranged that the proper pole to be used in connection with them may be easily selected.

Negative.			Positive.	
		−	+	
Hydrogen Dioxid	H_2O	O	Ag	NO_3 Silver Nitrate
(Pyrozone)			$C_{17}H_{21}NO_4$	HCl Cocain Hydro-
Potassium Iodid	K	I		chlorid and other alka-
Sod. Hypochlorite	Na	ClO		loids, such as
(Electrozone)			$C_{17}H_{19}NO_3$	H_2SO_4 Morph. Sulfate.

The vertical lines show simply the separation of the ions by the current, and the direction those needed, desire to travel. Thus, negative O, I, and ClO go toward the positive pole, while the positive, basic principles like silver, cocain, and other bases as compared with acids, go toward the negative pole. The pole to use, therefore, is the same in name as the active penetrating principle of the drug employed, for, as we know, likes repel likes and opposites attract.

In regard to the question as to whether "non-conductors, like alcohol, chloroform, phénol, tinct. iodin, etc., either singly or mixed, can be used successfully in cataphoresis," I am inclined to answer in the affirmative. We must remember that the current is conducted by the tissues from pole to pole independently of such substances, and, owing to the pressure of the current itself (and H, if the positive pole be applied), they can be induced to penetrate farther than by mere absorption.

Chemico-metallic processes intended for the filling of tortuous root-canals are worthy innovations on the older methods. The interaction between the acid Dr. Weld uses (modified nitro-hydrochloric) and his pin alloy, composed mainly of zinc, with also

some silver and tin, results in the production of compounds the virtues of which are strongly indicated in such positions. Nitrosyl (NOCl), an unstable disinfecting gas, and zinc oxychlorid (ZnO, $ZnCl_2$) are the principal bodies formed, together with some silver oxid (Ag_2O) and stannic chlorid ($SnCl_4$).

In the June number of the *Dental Cosmos*, page 497, appears an article from the *Journal of the British Dental Association*, reported by H. Bellamy Gardner, which deserves some criticism at our hands, inasmuch as it positively contradicts a statement made by the writer in an address to the American Dental Association last year. The article in question gives in detail a series of experiments on N_2O by Drs. Kemp and Brush, to "prove its specific anesthetic influence as distinct from any inert gas" like N.

Dr. Brush was "convinced that N_2O does not produce its influence simply by depriving the patient of oxygen," and Dr. Kemp states that "he was unable to obtain a compound of N_2O with the hæmoglobin of the blood." These conclusions we can safely indorse, but to another assertion by Dr. Kemp I must decidedly object. It is as follows: "With regard to the general metabolism, one result of these researches is to show positively that CO_2 in the *arterial blood* (the italics are mine) is greatly diminished, and is *not* increased, so that any theory involving the dependence of anesthesia on a retention of CO_2 within the system is in opposition to the direct findings of the experiments." Now surely Dr. Kemp knows that CO_2 does not escape from the body by means of the arteries. As well might he assert, so far as scientific deductions and historical facts are concerned, that he had searched the Great Salt Lake of Utah for evidence of the work done against Spain by Admiral Dewey and could find none; therefore Admiral Dewey is not entitled to the distinction of smashing the Spaniards in Manila harbor.

If Dr. Kemp will kindly examine anywhere on the venous side of the capillaries, instead of on the arterial side, after giving his dog an average dose of N_2O, he will find strong evidence of accumulated CO_2. N_2O is rich in O, but it is a chemical compound, differing in this respect from either free O or the air we breathe. It forms no direct combination with any substance; it is active only by the O it sets free to oxidizable bodies. With it and C, H, S, P, etc., the normal oxids of these elements are produced,

CO_2, H_2O, SO_2, P_2O_5, etc. These facts are easily proven by experiment.

It obeys the same rules governing its own chemical nature in the animal body as well as elsewhere. When inhaled it goes through the arterial circulation unchanged, superseding for the time being iron, the oxygen-carrier of the body; and when the capillaries are reached it gives up its O to form the same combinations with C, H, etc., that atmospheric O produces, but to a greater extent. The CO_2 developed thus in greater quantity than usual cannot escape freely beyond the point of its development, for the simple reason that the reduction of the ferric oxid in the arterial blood is not accomplished, leaving the iron unprepared to convey the CO_2 as ferrous carbonate to the lungs. If, however, either free oxygen or air be administered simultaneously, or at short intervals, one of the physiological functions of iron is restored sufficiently to prevent the cyanosis of CO_2 congestion; and so, according to the case in hand, the animal may thus be kept indefinitely in the anesthetic condition without serious danger of death by asphyxiation.

Such in brief is the carbonic acid theory of anesthesia by nitrous oxid (N_2O); and it is indeed gratifying to know that, after lying in a state of more or less "innocuous desuetude" for many years, the subject is again revived and is being investigated by such an institution as the Johns Hopkins University.

SECTION VI.

Etiology and Physiology.

REPORT BY J. D. PATTERSON, CHAIRMAN OF THE SECTION.

PROFESSOR VAUGHN, of the University of Michigan, says that "every infectious disease is actually an intoxication." Pathogenic germs are the poisons, and it follows that the study of the toxic theories of disease should be well known and thoroughly discussed by the members of the dental profession. At the inception of the inroads upon the dental arch from caries stands a specific organism, and in the long train of surgical pathological conditions which the oral surgeon is called upon to ameliorate or cure we find numerous varieties of micrococci and bacilli; and their presence demands from us a knowledge of their biology.

In looking over the field of investigation into the toxic theory of disease since our last meeting, I desire to direct your attention to an address by Thomas Richard Frazer, M.D., F.R.C.P. Edinburgh, published in the *British Medical Journal* for July. I deem his review of the subject, given so recently and so ably, an epitome, and therefore make the following extracts:

Referring to the importance of the study he says, "Diagnosis, for the most part, deals only with the symptoms; it has no immediate concern with the nature of the malady, and until this has been determined progress in the treatment can only be tardy and unsatisfactory. The history of medicine has shown that the advance in these two departments has rarely if ever been parallel or equal."

If, as the speaker says, this is true of medicine, how much more

is it true of the rank and file of dental surgeons, many of whom know a little of diagnostic signs, but absolutely nothing of the etiological factors precedent to them? If this new National Dental Association could resolve not to admit to membership any without a reasonable biological knowledge of the principles which explain the presence of pathological conditions, what a step forward it would be. The operator at the dental chair who, with the assurance born of ignorance, treats the most exquisitely sensitive tissue in hyperemic and inflammatory conditions, and who scarcely is aware that there is a science of bacteriology, should receive the severest censure.

Professor Frazer continues: "The organism, even in a state of health, is a veritable storehouse of these toxic substances." "The pathogenic action of the microbes was at first attributed either to mechanical obstructions of the blood-vessels, caused by their accumulation in them, which resulted in asphyxia of organs essential to life, or to a biological action which enabled them to appropriate materials destined for tissues of the body, and thus deprive these tissues of life. While, in the case of a few of them, both of these actions may to a slight extent explain their effects, it was subsequently proved that these effects are mainly caused by the poisons which they produce. The poisons are of a complex composition; some are alkaloids, others modified proteids, and others, again, have altogether unknown chemical composition. Some of them are of extreme and almost indefinitely great activity.

"Large numbers of disease-producing poisons are thus present in the body, created by the normal processes of life, and abundantly produced by departures—even in themselves unimportant—from these processes. Many substances well known to have poisonous properties are intentionally introduced into the body, such as alcohol, tobacco, tea, and opium; while others, such as lead, accidentally find their way into it. The respiratory passages and intestinal canal are crowded with micro-organisms, and they teem in the soil, air, and articles of food. When they find a lodgment in the body and find conditions congenial to development they proliferate with immense rapidity."

As a contribution to the subject Professor Frazer advances the following: "Although searched for, no proteolytic or fermentative action has been discovered in the case of any toxin or venom;

by subjection to certain external influences, such as elevation of temperature, and the influence of electric currents and of certain chemical reageants, toxins and venoms may have their poisonous actions destroyed, while the immunizing or protective action is retained; and toxins have been found actually to contain protective or remedial substances along with their toxic ingredients.

"There are undoubtedly many facts still required before a convincing explanation can be found and formulated of the origin of the antitoxin substances that appear in the body after the reception of pathogenic or other toxins, but the facts already ascertained appear to indicate that the antitoxic or immunizing substance originates not from vital reactions upon constituents of the body, but from the toxins themselves, being introduced by chemical changes in them, or being actually among their normal ingredients. In the case of the ordinary poisons it has been well established that recovery is largely due to hastening the removal of the poison from the body, especially by the means which it is the province of pharmacology to indicate, and the eliminative treatment which has long been followed in many diseases thus finds in their now definitely defined toxic origin a sufficient explanation. Clinical and experimental evidence not restricted to ordinary poisons, but gained also from the study of the effects of toxins and venoms, has taught us that treatment should also include the adoption of measures for increasing the resistance afforded by the body to toxic and morbific processes. For this reason the antitoxic serums frequently in use at the present time must be regarded as too dilute solutions. It is indeed probable that the process of immunization, even when carried to its utmost limits, is incapable of producing antitoxic serums sufficiently powerful in doses which can be administered to cure a patient suffering from the effects of a large lethal quantity of toxin."

"Considering how limited were the means—if, indeed, they previously had existed—of actually preventing death when the fatal disease conditions were already present, a special fascination attaches itself to the antidotal treatment of disease, the newly-created serum-therapeutics. It has merely entered the first stages of its development, and has had to contend in its application to human beings with the difficulties presented by the presence of undiscoverable amounts of disease toxins, diffused by living

generators, which are present in the body in unknown quantities and in varying toxic potentialities." Professor Frazer also calls attention to the treatment of sarcoma or other new growths by means of toxins, and says "it is a subject of great interest to the surgeon."

The *Dental Cosmos* for August contains an article by Edward C. Kirk, upon "Abscess upon Teeth with Living Pulps," and an abstract of his remarks upon the etiology of the condition is as follows: "When we endeavor to explain the etiology of abscess of the pericementum of vital teeth, as the result of infection by bacteria, the relation of cause and effect is less obvious, because the possibility of access of bacteria or their ptomaines via the pulp-canal is eliminated as a factor and the modus of the infection must be sought elsewhere. There being no break in the continuity of the gingival attachment in the cases under consideration, we naturally consider the vascular circulation of the tissue as the most probable means of entrance for the irritant which is the exciter of the inflammation in question. That pathogenic bacteria may exist in the blood-stream and, meeting a *locus minoris resistentia* in a tissue, may set up an inflammatory process at that point, is a well-established pathological fact, and it is not at all impossible that the immediate cause of pericemental abscess may be accounted for in that way. There is, however, a question of a predisposing cause, which in these cases is of vastly more importance, and which, when clearly made out, will enable us to cope rationally with a group of dental pathological conditions which have been the *bêtes noires* of dental practice since its genesis as a calling. Broadly considered, any inflammatory action is a disturbance of the normal processes of nutrition, the disturbance being proportionate to the intensity of the irritative action. Where bacteria and their products are the excitants of inflammation, their effective invasion is conditional upon the vital status of the tissue concerned. If the vital resistance of the tissue is sufficiently high it becomes immune, and bacterial invasion is impossible. The vital potential of a tissue is the result of the sum-total of its nutritive processes performed. Any interference with the normal nutritive process therefore results in a diminution of the vital potential of a tissue, and it renders it liable to invasion by bacteria, with consequent inflammatory reaction. A disturbance of normal

nutrition is therefore a precedent condition to effective bacterial invasion.

"The nutritive disturbances which predispose to the particular inflammatory action under consideration are, in the opinion of the writer, those arising from auto-intoxication, which has two sources of origin,—viz, by toxic substances produced by the human organism as side products of its own nutritive processes, and, second, by the waste products of saprophytic bacteria acting within the digestive tract, particularly the intestinal canal."

"For reasons not altogether clear, the articular tissues appear to be particularly vulnerable to the irritative action here noted, and in this category we include the pericemental membrane.

"The clinical phenomena manifested by a vital tooth, the pericementum of which is the seat of abscess, are of interest when viewed in the light of the foregoing presentation of the toxemic character of the irritant. It has already been noted that teeth so affected almost invariably show evidences of hypercalcification of the dentin. They are hard, dense, semi-translucent, and usually free from caries. Evidently the functional activity of the odontoblastic layer of pulp-cells has been unduly stimulated by an irritant of the right intensity to induce functional activity beyond the normal point, and that activity of function has resulted in the calcification of the dentin noted." "It is reasonable to suppose that a corresponding excessive functional activity has been manifested in the histological elements of the pericemental membrane. Indeed, it is not uncommon to find evidences of hypercementosis upon the roots of these densely calcified teeth."

"The close agreement of the pathological phenomena as between gouty arthritis and this form of pericemental abscess is striking." "So-called gouty pyorrhea and pericemental abscess are but the local expressions of a disorder having a common constitutional origin."

We note a paper by Dr. Wm. A. Mills, of Baltimore, upon "Pathologic Conditions of the Pharynx and Contiguous Structures during Early Childhood Prime Factors in the Etiology of Malformed Maxillæ and Irregular Teeth," read before the Section on Dental and Oral Surgery, American Medical Association *(Dental Cosmos)*. In this paper the author takes the ground that inflammatory lesions which obstruct or prevent the functional use of

nasal cavities in children between the ages of four and twelve years are, in the majority of cases, the chief agents in the causation of malformed jaws and the consequent abnormal alignment of the teeth.

Dr. E. H. Angle, in a paper read before the Kansas State Dental Association last May (*Western Dental Journal*), also called attention to the same subject treated of by Dr. Mills, and advised against efforts for correction until the nasal abnormalities were removed.

Dr. A. H. Thompson, Topeka, Kan., read a paper at the same meeting (*Western Dental Journal* for June) upon "Some Studies in Relation to the Causes of Malposed Teeth," in which he advanced the idea that the primary cause of degeneracy and irregularity in the jaws and teeth has its origin "in the conditions surrounding the evolution of the jaws from the gill-arches," and that "degeneracy in structure and form comes from the inertia of disuse and lack of the impetus of inherited growth force." He further says, "Inasmuch as the face is the normal result of the lateral visceral half-arches joining the median structures projected from the front of the brain-case, it follows that if there is any want of harmony between the two genetic movements *errors of symmetry may readily occur*." He contends that "an explanation may thus be given which reasonably accounts for the asymmetry and want of development of one or both halves of the dental arch, and that, while the union of the arches may be complete in the median line, there may be defective and asymmetrical development of the bodies of the maxillæ, with consequent abnormality and irregular position and crowding of the teeth."

Dr. Edgar Palmer, of Los Angeles, Cal., writes upon the "Irregularities of the Human Teeth—Some Causes and Remedies." Dr. Palmer's especial claim is that the cause of irregularities is malnutrition, and he says, "The evolution of tissue depends upon the constancy and perfection of the nutritive supply. A child impoverished, and therefore undeveloped, with diminutive jaws, has to give room to a fixed number of teeth of fully-formed diameters, and, of course, in such a case the result must be a crowded and irregular denture, sometimes amounting to actual deformity."

Dr. G. V. I. Brown, of Duluth, Minn., read a paper before the Dental Section of the American Medical Association, 1898, upon

"Hyperkinesis of the Muscles of Mastication a Symptom and an Etiologic Factor in Nervous Affections, particularly Neuralgia of the Trigeminus and Diseases of the Jaws."

We note a paper by Geo. T. Carpenter, M.D., D.D.S., of Chicago, upon "Anterior Pillars of the Fauces; Their Abnormality, Etiology, and Treatment," read before the Dental Section of the American Medical Association at its last meeting *(Dental Cosmos)*.

Charles Stedman Bull, A.M., M.D., of New York, in a paper read before the New York Institute of Stomatology, January, 1898 *(Pacific Medico-Dental Gazette)*, writes of the "Connection between Diseases of the Eye and Teeth." He says, "Attempts have been made in the past by the advocates of the reflex theory to regard all lesions of the anterior segment of the eyeball, in cases of dental diseases, as due to some disturbance of the trifacial nerve, while lesions of the posterior part of the eyeball are considered to be of an inflammatory, infectious nature, propagated directly from the diseased teeth or upper jaw to the orbit and thence to the eyeball." This, Dr. Bull says, "is a fanciful classification which is not justified by our clinical or pathological knowledge." He also says, "Cases of iritis occurring in the course of abscess of the maxillary sinus with dental caries are probably of pure microbic origin." "Pus starting in an alveolus may perforate it, but, on the other hand, it may not destroy the alveolar wall but pass through the canaliculi or foramina at the apex of the alveolus, and thence into the infraorbital notch, or through one of the orifices situated in front of the lachrymal sac in the ascending ramus of the superior maxilla. These orifices often communicate directly with the nasal fossæ or antrum, so that the pus coming from a carious alveolus may reach the orbit either by passing through the sinus or around it."

The *Atlanta Surgical and Medical Journal* for May, 1898, contains an article upon "Empyema of the Accessory Sinuses of the Nose," by Frank M. Hayes, M.D., of Staunton, Va., which is of interest to the dental surgeon.

In an article upon "Aphthous Stomatitis," by A. Levi, Germany, the claim is made that the disease is the result of poisoning from toxins contained in the milk fed the child.

P. M. Barbour, M.D., Louisville, in an article upon "Rachitis,"

says that children fed upon milk deficient in fat, condensed milk, and the Liebig's foods are very apt to develop rickets.

Books issued during the year treating of the subjects of this Section are "Injuries and Surgical Diseases of the Face, Mouth, and Jaws," by J. S. Marshall, M.D. A most admirable arrangement in the work of Dr. Marshall is that review questions follow the conclusion of each chapter, so that the teacher's work is rendered correct and less laborious. "Dental Pathology, Therapeutics, and Pharmacology," by Dr. H. H. Burchard, of Philadelphia, and "Oral Pathology and Practice," by W. C. Barrett, M.D., D.D.S., of Buffalo, N. Y.

SECTION VII.

Anatomy, Pathology, and Surgery.

REPORT BY W. C. BARRETT, CHAIRMAN OF THE SECTION.

FOR some years Section VII has occupied more than its fair proportion of the time of our annual convocations. Especially was this the case last year, when as a part of its presentation there was exhibited at Old Point Comfort what was probably the finest collection of specimens in comparative odontology ever got together. This year the Section purposes a greater degree of modesty, and to give to the others a chance.

And yet, subjects of the basal importance of anatomy, pathology, and surgery must not, for the credit of the Association, be passed over in silence. The Section will therefore present its report, but it has made no special effort to obtain papers.

During the past year nothing of great interest has offered in anatomy. The vascular supply of the tooth-pulp has been considered by papers and lantern exhibitions, given by J. L. Williams, of London, and M. H. Cryer, of Philadelphia. The former, in a paper in *Items of Interest*, illustrated by micro-photographs, supports the views held by some anatomists that the vascular supply of the tooth-pulp must come from the pericementum, and that the preparations and cuts representing the inferior dental artery as giving off branches which enter at the apical foramen of each tooth-root in the lower jaw, and from the anterior and posterior dental arteries of the upper jaw, are misrepresentations of the real condition, the pericementum being in fact the placental organ that supplies the tooth-pulp with nutriment in all cases.

On the other hand, Dr. Cryer, at the annual meeting of the New

York State Dental Society, presented preparations that would lead to the belief that the old text-books were right. These preparations were, however, macroscopical in character, and in neither the exhibition of Dr. Williams or Dr. Cryer was anything conclusive presented. Dr. Williams must show that his preparations positively bear the interpretation given them by him, and Dr. Cryer must determine by injection that there is a direct communication of the dental pulp with the dental artery before his deductions can be accepted as final. They should also be presented without any artificial coloring, which is so apt to be misleading. The subject is one that may well engage the attention of microscopists and anatomists during the coming year.

In surgery nothing specially new has been presented. Professor Brophy's operation for the radical cure of cleft palate seems to continue successful, and during the past year he has performed it a considerable number of times, some under the personal observation of the writer, and in every case, so far as he knows, it has proven a success. An interesting point arises in the consideration of this subject. It is known to all who have kept pace with surgical advancement that this operation consists in forcibly bringing the separated osseous borders of the palatal arch into coaptation, and holding them there until union has taken place, subsequently closing the soft palate by a modification of the usual surgical procedure. This latter operation is rendered simple and entirely successful, because the edges have been nearly brought in apposition by the previous closing of the hard palate, and there is consequently little stretching of the tissue or drawing away of the closed velum from the posterior walls of the pharynx. It is well known that the operation of staphylorrhaphy has been abandoned by most good surgeons, because through this fatal defect it seldom resulted in any radical improvement of speech or deglutition.

Here comes in the surprising part. The bringing together of the divided palatal walls necessarily reduces the maxillary arch, and the upper jaw is contracted from one-third to one-half. In some instances, when united, the palatal portion of the jaw is not more than three-quarters of an inch in breadth. It would naturally be anticipated that this must result in a greatly deformed upper jaw, and that the superior teeth, if they are developed at all, must be inside the lower ones. To the surprise of every one who has

watched these cases, this has not occurred. If the operation is performed early enough,—and Professor Brophy prefers to make it within a week of birth when practicable,—the superior jaw develops into the normal size, and in numbers of instances when the deciduous teeth are erupted the upper and lower ones are in perfect occlusion. What mysterious process of nature governs this function, and how it is that the teeth are so exactly guided into the precise normal occlusion after this, at times, very great reduction of the size of the jaw, we can only conjecture. We cannot pronounce upon the law that induces the more rapid rate of growth of the superior jaw, which, when the teeth are ready to erupt has made it exactly overtake the lower one, but it is a lesson in surgical procedure that may well engage our earnest attention.

In pathology there is more of interest than can well be summarized in this necessarily brief report. Concerning the pathological changes in pyorrhea alveolaris, and the various theories entertained, there has not yet been anything definitely settled. The advocates of the different hypotheses advanced yet hold to their pronounced views, but no one has been able to demonstrate his faith to the entire satisfaction of the others. That the condition presents many phases, some of which are indisputably local and some probably general, few will deny. That there should be a differentiation of them, and a clear line drawn between merely local disturbances and constitutional degenerations, no one will dispute. There are so-called pyorrheal conditions that are demonstrably due to serumal deposits, and there are others quite as pronounced in which there never has been any deposit whatever upon the roots of the teeth. The symptomatography of these various morbific changes should be clearly outlined, that we may better understand their etiology. That in all cases, not purely local in character, the pericementum is seriously involved, if not the sole seat of the diseased action, seems apparent, because its destruction, either by the final extraction of the involved tooth or its temporary removal with destruction of the pericementum, and subsequent replantation with the consequence of new pericemental formation, is an almost infallible cure. The subject is one that needs yet further elucidation.

In degenerations of the mucous membrane of the antral sinus a

difference of views has been expressed, some urging the insertion of a tube into the artificial opening, when such is made, and others deprecating it. The object in opening the antrum is either to afford a means of exploration or to give drainage to pus. In the former case, when the object has been accomplished, there would usually seem to be no necessity for keeping the opening patulous. When drainage of pus is the end sought, a tube would appear to defeat that. Drainage must not be occasional and periodic; it should be continuous. To place a plug in an antral opening, and to remove it and wash the cavity out at stated periods, would appear to be a very mistaken method of treatment. If pus is retained for but one hour, it undergoes degenerative changes which intensify the septic condition. The very moment that pus accumulates, even in the smallest quantity, after its complete formation, the influence of any antiseptic treatment is lost, and there is an immediate deterioration. In many instances that have fallen under observation, the occasional washing out and cleansing for an hour is succeeded by possible days of steady degeneration, because the pus is retained within the cavity and keeps the territory in a septic condition. The very first principle of antiseptic surgery is that pus must at once be eliminated at any risk. Anything can better be retained within the tissues or within a cavity of the body than pus, which is the septic product of infection, and which is itself the product of degeneration, and which is infective and degenerative in its very nature. It is this retrograde metamorphosis that results in the formation of pus, and which in turn pus perpetuates, that is the source of danger.

It would naturally seem to follow, then, that a cavity that must be drained should be left permanently open so long as there is any pus-formation that must be drained away, and that tubes and plugs and tents are necessarily mischievous in their nature, because they tend to retain the discharge and thus perpetuate the septic condition.

But, it is urged, unless an alveolar opening be closed, saliva and food *débris* will find their way into the sinus. This danger is more apparent than real. Saliva seeks the most dependent point as readily as does pus. Food does not rise against gravity, and if it is forced into the antral cavity it will do no harm until fermentation shall have taken place; and if that does occur the result of it, with

the *débris*, will work downward through the same hole that it went in at. In any case its presence is infinitely to be preferred to that of pus.

But, it is further urged, the opening will be closed up by hypertrophic growths. Not if it is large enough, and it certainly should never be less than the size of a common lead-pencil if it is to serve for drainage. Besides, the irritant presence of a tube is certain to cause exuberant granulations about it, and hence tends toward that which is to be avoided. If there are hypertrophic growths about the edge of the opening they are very easily removed with a bistoury, and then a cauterant, even so simple a one as carbolic acid, will for some time prevent their reformation. In view of all these facts, it would seem that a drainage tube for the antrum is an aggravation instead of a benefit, in most instances at least.

The precise action of arsenic when applied to vascular tissues, and especially the changes succeeding its application to the dental pulp, have never been sufficiently demonstrated or explained. We know that it is a corrosive poison, inducing arterial congestion, with final stasis. It has been held by various authors that death of the tooth-pulp is caused by this congestion, which produces strangulation at the constricted foraminal apex. This must be an error. The application of the minutest portion of arsenious acid to the pulp of a partially developed tooth, in which there is no closing of the apex into a foramen, but in which the end is completely patulous, is as positively fatal to the vitality of the pulp as in the case of the most completely formed root. It is also true that its application to the mucous membrane of the buccal cavity results in death and sloughing of the tissues, as many of us have learned to our sorrow. In neither of these instances is it possible to obtain strangulation, because there is no constricted opening; hence that theory must be abandoned as untenable.

Devitalization of tissue cannot well be brought about by direct union of the arsenious acid with the tissue itself, for the minutest amount seems sufficient if directly applied. We also know that in arsenical poisoning through the introduction of the agent into the digestive tract, it is not found distributed through the body. There is an intense congestion of the villous coats, with stoppage of the local circulation and breaking down of the vascular walls.

The pain excited in a tooth by the exhibition of arsenious acid is the local analogue of that which is the consequence of the internal administration of arsenic in poisonous doses. Death in the latter case appears to be due to the nervous shock, which terminates in complete collapse. All this would seem to indicate some special dynamic energy, communicated through nervous disturbance and by continuity of tissue. The action of arsenic on the dental pulp is not essentially different from its effects on intestinal tissue when taken internally. Why its baneful influence is not more often communicated beyond the apical foramen, when we consider the reckless manner in which unnecessarily large amounts of it are applied, is a matter of astonishment.

The minimum amount required for pulp-devitalization when directly applied has not been definitely ascertained. The present writer has in his possession one of the very small vials, holding a dram or so, in which arsenious acid is sent out by the supply houses. For ten years this has been what the ordinary observer would call exhausted. Yet, although he probably uses the drug as often as the average practitioner, it is still in use, and he anticipates that it will last him for the remainder of his life. When necessary, he pours in a few drops of creasote to moisten the interior, and then inserts a closely rolled pledget of cotton. This he persistently mops about with a pair of pliers until it is thoroughly saturated, when he finds that the creasote has in solution or mixture enough of arsenious acid obtained from the walls of the bottle, over which it has formed a thin coating, to make the cotton all-sufficient for use. A bit of this not larger than the head of a pin is quite enough to devitalize any ordinary pulp, and it does not demand a second application.

A great mistake in the use of arsenious acid is often made. An unnecessarily large quantity is applied to a tooth-pulp and left for twenty-four or forty-eight hours. Upon attempting to remove the dead pulp the operator finds at the apex an exceedingly sensitive point, and he immediately concludes that the work has not been entirely accomplished, and that the pulp at the apex is not yet devitalized. So he makes a second application, and this may be succeeded by serious complications. The fact is, he used altogether too much in the first instance. This caused an intensely inflamed, irritable condition of the corpuscles of the cementum at

the extremity of the root, and it was this cementum that he reached with his broach. You are aware that the apex of the tooth-root is formed of cementum, and not of dentin. A second application of arsenious acid may destroy the vitality of this apical cementum altogether, and induce serious trouble. If the tissue within the pulp-chamber is found devitalized, there is no question concerning that within the root-canals. Instead of another application of the irritant poison, exactly the contrary treatment should be inaugurated. The arsenic should be neutralized by an application of dialyzed iron, and soothing anodynes should be employed until all danger of further action of the poison shall have passed away. Then the canal may be finally cleansed and filled.

There are many other points of great interest that might be summarized, were it not that the time for the consideration of the subjects is limited.

A number of new books have been presented on subjects that are germane to the Section, but it will not be expected that they will be considered in this report. They belong rather to Section II, and will doubtless be considered in the report upon Dental Education.

As a part of its report, the Section desires to present for the consideration of the Association the following papers:

"Anatomy: A Critique." By William Ernest Walker, D.D.S.

"Comparative Methods of Teaching Dental Anatomy." By A. H. Thompson, D.D.S.

"Some Special Points in Anatomy." Illustrated by Lantern Slides. By M. H. Cryer, M.D., D.D.S.

SECTION VII.—Continued.

Anatomy: A Critique.

PAPER BY WM. ERNEST WALKER, OF THE SECTION.

THE editor and publishers of Gray's "Anatomy" are to be congratulated on their enterprise in getting out an 1897 edition, notwithstanding the fact that they had brought out a revised edition in 1896. Their work has in most particulars been admirably well done. The improvement in the section on the mouth and teeth, over any previous edition, is very marked, and in many respects is thoroughly up to date. A few errors have crept in, however, to which I desire to call attention, not only that correction may be made in the next edition, but that students may avoid the error of adopting as fact the statements which I shall point out as incorrect. I do not mean by this to say that there are or are not other errors than those I shall here indicate, as I have not studied the section exhaustively; but the points to which I shall direct your attention are so noticeable, to my mind, that they at once arrested my attention. In the words of Dr. H. H. Burchard, "I am a firm believer in precision, not only as to the application of words, but also as to their definition." I will therefore first direct your attention to some minor points in this direction.

On page 932 of the volume under consideration the names of the surfaces of the teeth are given, with definitions, as labial, lingual, buccal, distal, proximal, the definition of *proximal* being "that surface toward the mesial line;" proximal being used as the reverse of *distal*, the latter being defined as "that (surface) away from the same" (that is, from the mesial line). Both of these definitions are misleading. No definition of mesial having been given, the student turns to his dictionaries for light. In Gould's "Dictionary of Medicine" he reads, "mesial, same as median." Turning to *median* he reads, "middle, meson, or mesial," with reference to "M. line." Turning to *line* he finds a table appended in which

"median line" is defined as "a line joining any two points at the periphery of the meson or median plane of the body."

Referring to *plane* he finds "medial, median, and mesial plane; a plane generally antero-posterior, dividing a body into two symmetrical halves." The confusion thus arising might have been avoided by adopting the definitions of Dr. G. V. Black, as found in the Transactions of the American Dental Association for 1895, as follows: "Distal, away from the median line of the face, following the curve of the dental arch." "Proximate, applied to a surface of a tooth (either distal or mesial) which is next to another tooth." "Mesial, toward the median line of the face, following the curve of the dental arch." The mesial surface, however, is not included in the list of tooth surfaces given, proximal being evidently intended to indicate the reverse of distal, the former being described as toward the latter, away from the mesial line. In the text, however, except in the definitions, proximal is not used as the name of a tooth surface, mesial being substituted throughout, although nowhere defined. For instance, on page 933 we read, "The mesial and distal surfaces are triangular;" "short mesial" and "long distal cutting edges;" "they are flattened mesially and distally," etc. Thus *mesial* and *distal* are used in conformity with the definitions formulated by Dr. Black, and it is to be regretted that no definition of *mesial* was given.

On page 933 the cuspids are spoken of as *canines*, a term which the Committee on Nomenclature of the American Dental Association agreed should be discontinued, together with wisdom-tooth, sixth-year molars, etc. A slight error occurs on this page in speaking of the superior cuspids in these words: "the concave *labial* surface is marked by three ridges uniting in a basal ridge." Undoubtedly the *lingual* surface is here intended.

On page 935 we read as follows: "The movement of the human mandible is forward and downward, the resultant of these directions being an oblique line, upon an average of 35 degrees from the horizontal plane." Reference being made to a footnote reading, "W. E. Walker, *Dental Cosmos*, 1896," I feel at liberty to make the following remarks: For "mandible" read "mandibular condyles;" for "35 degrees from the horizontal plane" read "40 degrees from the facial line." There can be no angle from the horizontal plane, as there is no horizontal plane in the head. The plane of

condyle movement forms an angle of 35 degrees (average) with the plane of occlusion, which, however, is not a horizontal plane; but if we suppose the facial line to be placed vertically, then, of course, a line perpendicular to this would be horizontal. In such a case we would find the plane of occlusion forming an average angle of 15 degrees to this imaginary horizontal plane, which, however, would form with the plane of condyle movement an average angle of 50 degrees, instead of 35 degrees, as stated in the text.

The text continues: "When the lower jaw is advanced until the cutting-edges are in contact, the jaws are separated; but as the highest part of the lower arch—its third molar—advances it meets and rests upon a higher point, second molar of the upper arch, and thus undue strain of the incisors is obviated." A similar statement is made by Bödecker in his "Anatomy and Pathology of the Teeth;" but my studies of the articulation and occlusion of the human teeth having convinced me that it is an error, I expressed that view in a discussion of the Chairman's Address in the Dental and Oral Section (now the Section on Stomatology) of the American Medical Association in 1896. Finding this statement reiterated in the present edition of "Gray," I concluded to investigate the matter more closely. I therefore went to the college laboratory and made casts of the students' mouths, taking them as they came, until the number reached thirty-three, rejecting only those mouths in which very many teeth had been extracted, which could, of course, show nothing on this point. These were not selected cases. I took them exactly as they ran, proceeding as follows: A roll of soft modelling composition was placed on the lower teeth and the student instructed to bite on his incisors, bringing the morsal surfaces squarely together. The upper and lower impressions were then filled, the plaster coming in contact posterior to the teeth, thus making a so-called plaster articulator. The impression material was then removed, and the relation which the upper and lower teeth bore to one another was readily seen. As each bite-impression was taken and the cast made it was marked with a number, and the number entered on a list with the name and age of the student. I have this list with me, and will be pleased to answer any questions in regard to the physique or physiognomy of the subjects. I also present the casts for your inspection. Of the thirty-three it

will be seen that twenty-two have the molars entirely free when the incisors are placed end to end, though in two of these cases they do *nearly* touch. Of the others seven are excluded because of abnormality, the incisors meeting end to end at all times, there being no overbite in occlusion and no *shearing* motion. I was surprised to find so many having this peculiarity. Of the thirty-three, three only have actual contact of the molars in such manner as to balance the incisors in biting, according to Bödecker and Gray, 1897 edition. These cases, however, prove the *exception* rather than the rule. Of one of these cases it must be remarked there is contact of the molars only on the right side, where the lower second and third molars have come forward, due to the loss of the first molar. There is no contact on the left side. The second case (No. 16) has lost the left upper second bicuspid and lower left first molar, also lower right second bicuspid and first molar. The third of the contact cases (No. 6) has no bicuspids, and only one molar on the left lower side, and shows great wear of the incisors. This is also shown in the normally occluded casts of the same mouth. Contact in this case is between the right lower second and upper first bicuspids and left lower second and upper first molar. The abrasion is so extreme as to permit of placing the incisors on end on opening the jaw but very slightly. I think you will therefore admit that the statement referred to is fairly disproved by this collection of casts.

I have also with me casts of three unusually symmetrical mouths, in each case showing the perfect occlusion as well as the biting position. You will note that these three cases also fully support my position. I think it will be found that the *balancing-contact* does not occur any more frequently in the lateral positions of the jaw than in the forward position, but this I have not proven so positively, not having taken the *grinding* impression of a sufficient number of cases to establish a rule.

The foregoing was written early this spring, since which time Dr. H. H. Burchard's "Dental Pathology" has been published. I note on page 178 that the statement again appears, this being the third time it has been given place in our text-books; first by Dr. Bödecker, and both second and third by Dr. Burchard, it being remembered that the portion of Gray's "Anatomy" in which the statement appears was edited by Dr. Burchard. As stated in

his recent work on "Dental Pathology," we read: "In the act of incising food the jaws are first separated and the lower jaw advanced until the cutting-edges of the upper and lower incisors are opposite one another. While the jaws are in position with the incisors in occlusal contact they do not bear alone the stress of whatever muscular force is applied, but it will be seen that the distal cusps of the third molars, the highest points of the dental arch, advance and meet the distal cusps of the upper second molars, higher points of the dental arch, so that when the incisors are in edge-to-edge occlusion, although all of the other teeth are separated to an extent governed by the overbite, the dental arch is supported posteriorly by contact of the last molars, thus preventing undue stress upon the incisors."

In addition to the bite-impressions which I have taken to ascertain the fact on this point, I have questioned a great many individuals as to whether their molars touch at the same time with the incisors when the latter are in the edge-to-edge position, the answer being almost invariably in the negative.

I can only conceive of one way in which this erroneous statement can have originated, and that is in Dr. Bödecker's having been misled by Dr. Bonwill's advice to construct *artificial dentures* with what he calls a "balancing articulation," so that the molars will touch at the same time that the incisors meet edge to edge; and also so that there will be contact when the jaw is thrown to one side, not only on the functional side, but also on the side that is not in use, in order to support the plate and avoid its displacement in mastication. But *nowhere* in Dr. Bonwill's published writings that I have seen has he claimed for ***natural teeth*** this balancing provision for contact of the molars when the incisors are in the edge-to-edge or biting position. The error, which I cannot trace farther back than the statement made by Dr. Bödecker in his "Anatomy and Pathology of the Teeth," has apparently been perpetuated by subsequent writers without any effort having been made either to confirm or to refute it, as far as I have been able to learn. I therefore request that if any one present has made any investigations in this direction we be given the benefit of such information as may have been obtained; that a definite conclusion may be reached as soon as possible as to the correctness or otherwise of the statement with which I take issue.

SECTION VII.—Continued.

The Comparative Method of Teaching Dental Anatomy.

PAPER BY ALTON H. THOMPSON, OF THE SECTION.

THE wonderful collection of specimens of the skulls and teeth of lower animals, with the valuable papers which accompanied the exhibit at the last meeting of this Association, and the reception accorded them by the members, attest the growing interest in the subject of Comparative Odontography. This revival is a matter of congratulation to the students of this branch, who have labored for years to impress upon the faculties of our colleges the value of comparative dental anatomy as a contributory science and the desirability of its full recognition in our curriculum. While many branches of science have been placed under contribution for material for the special education of those who are to enter the ranks of our profession, the advantages of the collateral branch of Comparative Dental Anatomy, for the side lights it throws upon human odontography, have not been fully recognized. It is therefore a pleasure to note the step forward that was taken at our last meeting, and the honorable position that was accorded to the subject. It speaks of better things to come for this branch, which we earnestly hope will be the subject of still further interest and investigation.

In the old days dental anatomy was taught by the study of the human teeth alone, and not much of that. The limited human denture comprised the whole range of the subject of odontography as taught by our books and in our schools. The teeth of lower animals were regarded as mere dental curiosities which had nothing to do with a knowledge of the teeth of man. His teeth were studied, as were other organs of his body, as if he were a special

creation, totally independent of, and separate from, other forms of life.

But all this is now changed. Science and the methods of study have been completely revolutionized. All life is now regarded as a unit. Man is but a part—indeed, a very insignificant part—of the great realm of nature. He is but a fraction of the great aggregation of living beings upon our planet. He was not a special creation, but is an animal like other animals of high and low degree. He has not a separate kingdom of his own, but is a vertebrate like other vertebrates. He has no exclusive class of his own, but is a mammal like other mammals. He has no order of his own, but is a primate, and shares this distinction with the apes and monkeys, and the sub-order of the *Anthropomorpha* includes not only man, but the higher apes as well. Cope says that the skeleton of the higher apes resembles that of man more than it does that of the monkeys below them. This is true also of the molar teeth, as those of man and the apes are more alike than those of the apes and monkeys.

The organization of man being thus closely related to that of lower animals, it is but proper and rational that the organizations of the latter should be studied in connection with that of man, for the benefits of the illumination to be obtained by the comparison of different, though related, types of structure. This has been fully recognized in other fields of human anatomy and physiology, which have become truly scientific only through the comparative method. The study of the structure and functions of the organs of lower animals, from the lowest to the highest types, has thrown much light upon our knowledge of the various organs of man. The paths of their evolution have been marked out and their life histories are now well understood. The comparative method has thus been indispensable to a proper understanding of the life history of man, and of the wonderful structure of his organs and the mysteries of their functions.

The *phylogeny* of man—*i.e.*, the history of the evolution of his type from the lowest forms—has been made possible only by the comparative method. In his *ontogeny*,—*i.e.*, the development of the individual in the embryo,—we have also learned much by the study of the embryo in comparing the various stages of growth with similar stages of development of lower animals, some of

which remain permanent in them. It is well known that the human embryo, like that of other vertebrates, recalls types of lower forms at various stages of its development. So it is also with the various organs, which have a course of development and a life history leading from the lowest to the highest types, and by careful comparison much is learned of the evolution of their structure and of their functions.

As the comparative method has been scientifically applied to the study of other organs, we claim that it is but rational that it should also be employed in the study of the teeth of man. By observation of the teeth of lower animals we can learn much of the phylogeny of the human teeth along with those of other animals, and also acquire a better knowledge of their functional offices. The life history of the teeth is of especial interest to us as dentists, and we must contemplate it from the scientific standpoint. We must note, first, that the teeth, like other organs, were developed for a functional purpose,—*i.e.*, the reduction of food preparatory to digestion,—and that that function is of stupendous importance to the economy. As the physiologist begins the study of the liver or lungs or heart in the lowest organisms in which a suggestion of these organs may be found, and follows their development and the increasing specialization of their functions up through the various phyla to the highest forms of life, he obtains a scientific knowledge of the phylogeny of these organs and of their functions. He is thereby better equipped to understand these organs and their functions in man. The life history of an organ and the evolution of its function cannot be learned by the study of the organ in man alone, but our knowledge must be amplified and illuminated by the investigation of the same organ in other animals. This is the method that should be applied in our study of the teeth of man in order to make our knowledge of them scientific. It is the scientific method, and if it is applied with benefit in regard to other organs it is but rational that this method should also be employed in the study of the human teeth.

By the investigation of the teeth of lower animals we learn many things concerning the origin and development of these organs. We learn first that the teeth are morphologically mere dermal structures and appendages, modified and elaborated for food-reducing purposes. This is well illustrated in the sharks, where the

transition from scales to teeth is complete. The typal form of a tooth is a simple cone, which is exemplified in the fishes and reptiles. The process of eruption and succession of the teeth is illustrated in the varieties it presents in different animals. The great variety of jaw-movements found in different animals is important in the influence that this force has upon the form and size of the jaws and the masticating apparatus, and especially the tremendous effect it has upon the forms and position of the teeth. We notice also the philosophy of tooth-forms in the evolution of types from simple to complex, and the relation that these types bear to the various functional offices that the teeth are called upon to perform in the work of food reduction and mastication. The adaptation of tooth-forms to the various kinds of food employed is most wonderful and beautiful when studied throughout the whole realm of animal life. The various types illustrate in a peculiar way the variations in the forms of the teeth of man, as adapted to their varied functions. We notice that his teeth are divided into different series, each one of which performs a distinct division of the general function of mastication. Thus the incisors were developed for and are well adapted to cutting purposes. In our comparative studies we trace the cutting teeth back to their origin, and then follow the evolution of the type down through the various phyla of animals to that of man. We thereby learn much of the evolution of the incisors and of their functions. We then take the prehensile teeth, the canines, and, beginning with the earliest appearance of this form of tooth and following it downward through the various stages of their evolution, we have a most interesting study in observing the extraordinary forms that this tooth presents in various animals. In man the canine is much reduced, but its phylogeny is most interesting and remarkable. Then we take the molar series, and, beginning with the earliest appearance of the crushing and masticating teeth, follow them down through the different phyla of animals and study the many forms of molars as adapted to various kinds of foods. The development of the molar teeth from simple to complex types is a most fascinating study, for the evolution of these organs, as described by Cope, Allen, Osborn, Scott, and others of the great anatomists and paleontologists, is most wonderful. These studies take us into fields where the highest genius of our race has exercised its powers,

and where great biological problems bearing upon the origin of our species have received illumination. The phylogeny of the human molar has been there made out, and through such discoveries light has been thrown upon the phylogeny of man. These studies are therefore surely worthy of our pursuit, and will as well furnish an intellectual exercise which cannot but be of benefit to our students.

In that connection we should study also the evolution and mechanism of the jaws and of jaw-movements as illustrated by lower animals. And right here we must say that there is no one branch of this important subject that is so much in need of illumination as that of occlusion, for its philosophy and mechanism are but imperfectly understood, and perhaps worse than imperfectly taught, in our colleges. The student cannot acquire more than the vaguest conception of its simplest principles, and yet a thorough knowledge of occlusion is of such vital importance to us in our every-day operations. Our lack of knowledge of this great principle is due to the fact that our studies have been confined to the human jaws, which, as we well know, are very rudimentary as compared with the jaws of many other animals. We need, therefore, to go far afield to learn something more of the mechanism of the jaws from animals in whom it is more highly elaborated and specialized. We need more light upon this obscure subject, and where can we go for it but to the field of Comparative Dental Anatomy? We need a thoroughly scientific study of occlusion, in order that we may better understand the philosophy of the subject as applied in our practical work.

The relation of tooth-forms to jaw-movements is an interesting branch of the subject when worked out in a scientific manner by the study of the teeth of different animals. In all of them we find that there is an exact relationship between tooth-forms and their functions and jaw-movements. The principle is capable of easy demonstration, although little investigation has been given to it. Years ago Dr. John Ryder propounded his famous theory of the mechanical genesis of tooth-forms in an essay that has become classic among dental anatomists, showing how the forms of teeth were developed by certain jaw-movements of a definite nature. The essay was a masterful presentation of a great but simple principle, and the wonder is that so little has been done in the further

elaboration of the idea. It is a field that offers great possibilities of discovery for the student and investigator.

We cannot elaborate the subject further, but hope enough has been said to show that the teeth of man are as much entitled to scientific study as any of his other organs, and that a great benefit would result to our knowledge of them from the proper application of the comparative method in the investigation of their structure and functions.

DISCUSSION.

DR. BROPHY: I desire to make a few remarks upon the subject of the treatment of the antrum of Highmore, as that was a part of the report offered by the Chairman of the Section.

There are so many complications in the management of diseases of this cavity that it would not be possible in the time allotted to one in the discussion to even enumerate them. In the management of these affections we must locate the cause of the disease. That cause may be within or without. It may be due to dental diseases, or it may be dependent upon any general disease of the mucous membrane. But we will assume that we have empyema of the antrum and abscess. Without going into a discussion of the cause of the affection, the first impulse of the surgeon on coming in contact with the abscess is to evacuate its contents. Naturally the question arises, Where shall the opening be made for the evacuation of the pus which this cavity contains? It would seem that the most desirable place for making the opening is at the base of the cavity, inasmuch as it would there receive continuous drainage at the most dependent part. If, however, the disease has become chronic, if it is of long standing, the surgeon should make an opening sufficiently large to enable him to explore the cavity to make an ocular examination of it; and to do that it occurs to me that the only reliable way is to make an opening through the canine fossa. And this brings me to a point in the paper read in reference to nomenclature. I digress just a moment to speak of some of the desired changes recommended by our friends who are working so faithfully on the subject of nomenclature. "The incisive fossa" is an expression so fixed in the minds of anatomists that it will not be possible, I think, by any action of ours, to cause anatomists to change that expression. I doubt very much that we shall succeed in bringing them to make use of the expression "cuspid

fossa," if you please. It will not be done, gentlemen, and I sometimes think we strain a point and go a little too far in attempting to modify the nomenclature of dentistry without taking into consideration the old and well-fixed expressions that we cannot possibly change. So much for that.

Now, when we come to the treatment of a case of this character, we must take into consideration many different conditions. We must first make a careful diagnosis. We must illuminate the nasal cavity. We must determine whether we have here the initial lesion of the disease. We must determine whether we have a dental alveolar abscess as the cause of the disease, an abscess the pus from which has made its way into the cavity of the antrum, and thus established the disease. We must determine whether the condition of abscess of the frontal sinus exists. This condition was first brought to the notice of the profession by Dr. Cryer, of Philadelphia, who called our attention to the existence of the communication from the frontal sinus into the antrum of Highmore without having a passage into the nasal cavity first. All these must be considered, and the practitioner who relies upon opening the antral cavity through the socket or alveolus of a tooth, a bicuspid or molar, and by injecting and draining it expects to invariably arrest suppuration by such a process, will frequently be disappointed. When suppuration continues, extending over a period of months and sometimes years, without his being able to effect a cure, he wonders why it is so. To him who gets into such a state as that, I would suggest that he go further, and in the event of his not having the appliances for a careful examination of the nasal passage and the determining of the question whether the disease of that passage has caused the disease of the antrum, let him call in to his assistance some rhinologist, or some one who is able to make such examination. The determination of the question as to whether we have an abscess of the frontal sinus; whether we have an abscess of the ethmoid cells as a complication of empyema of the antrum, or other conditions which are really beyond the domain of the dentist in the ordinary sense, is essential to effect a cure. We must comprehend all those conditions fully in order to be able to treat the disease in a scientific manner.

So then, to go back to the question of the opening of the antrum, this opening should be large enough to admit of a perfect ocular

examination of the cavity; and if we find disease of the bone, if we find a foreign substance there, we may remove it or anything that obstructs the process of repair and proceed in an intelligent manner in the treatment of the disease.

So far as the adjustment of the tube is concerned, as spoken of by the gentleman who presented the subject, I do not believe in these little tubes that are the size of a lead-pencil ferrule, but I believe in having a cannula adjusted with a large opening, with a flange on the outside by which it may be held in place. I believe in having the cannula large enough to enable us to thoroughly irrigate the cavity antiseptically, and then watch the progress of the process of repair. The small openings which are frequently made are, I think, of very little consequence except to temporarily evacuate the cavities. We cannot expect to retain them unless we adjust something that will keep them open, and the adjustment of something that will keep them open necessarily calls for the use of a tube, and, as I have said, I have little use for small tubes. In all cases where the disease does not promptly yield to treatment I prefer to make a large opening. Then we know what we are doing from the beginning to the end, and we can effect a cure in those cases where we might otherwise have them under treatment for months. Indeed, in many instances I have seen them run along over a period of a year or two years without any special benefit from the applications that were made.

As to the methods of treatment, that is altogether a different question. As to the manner of closing the cavity, I might say something, but I fear I have already occupied too much time.

DR. G. V. I. BROWN: In regard to antral cases, the proper procedure is to make the opening large enough to allow of a thorough examination of the entire antrum. Instead of using a tube, I have found it much more practicable in the last year or two, in nearly every case, to pack the antrum with antiseptic gauze. That, of itself, by its absorption will take care of the drainage. You do not have the secretions collecting about the tube, and granulation begins around the packing quite readily, and allows of its removal with safety in a short time.

DR. PATTERSON: I wanted to say one word in regard to the report, and that was the reference to the Brophy operation for the radical closure of cleft palate. Within the last two years I have

seen three patients upon whom this operation has been performed by Dr. Brophy, and the success is complete and perfect, something that I have never seen before. I have dickered with cleft palates a good deal in former times, making artificial contrivances for them. Later I got wiser and gave it up. I have seen the results of many operations of staphylorrhaphy from the hands of Dr. Garretson, Dr. Agnew, Dr. Bowditch, of Boston, and others, but never, except in the cases of the Brophy operation, have I seen a result which was at all successful in any way, shape, or manner, because the articulation was not improved. You who know about these cases know that the articulation is just as imperfect with a small lack at the posterior of the soft palate as it is with a considerable lack. Sometimes the patient will speak just as well with a large cleft, connected with a hare-lip, as he will with a shortening of half an inch at the posterior soft palate. So these former operations in staphylorrhaphy were invariably failures on account of lack of tissue, and I believed they would always be. When the Brophy operation first came out, I declared that to be my belief. But I want to set myself right on the question, because I have seen three operations in Kansas City, and the patients speak as well as you or I. The articulation is perfect. These are the first operations in this line that I have seen which were successful. Of course you understand the reasons for the failure in correcting the articulation, and that is the only thing you want to correct. So far as deglutition is concerned, after a while that is performed fairly well. Correct articulation is what you want, and it cannot surgically be improved in any way that I know of except by the Brophy operation, which forces the sides of the cleft together. I wanted to speak of this, because I have spoken against the operation, and until a short time ago I was still speaking against it. Now, I want to speak for it, and that is the reason I rose here. I consider it the greatest triumph of surgery that has come before the profession of medicine and dentistry within a number of years.

There is just one little point in the report that I want to speak of, and that is in regard to the pockets of pyorrhea referred to by Dr. Barrett, where there was absolutely no deposit, serumal or otherwise. I do not believe in that. I believe that the deposits are there, but not to be noticeable. I have seen as many cases of that kind, perhaps, as others, and if you perform the same opera-

tion of cleansing and scraping in those cases where there appears to be no deposit, even if on a careful examination with a probe you do not find those patches of calcic deposit, if you will perform the same operation with your chisels and your files for the removal of those deposits, the resulting cure comes just the same as if the deposits were noticeable. That is one proof that the deposits were there. Another proof is that if you extract these teeth and examine them with a strong glass, even where no patches are apparent to the eye, you will find little cactus-like points which are just as irritant as the larger ones. They are always there in those cases, in my opinion.

DR. BARRETT: I wish to say that wherever there are "pockets" I never have missed finding deposits. I did not refer to those cases at all. There is another form in which there are no pockets, but in which there is a constant breaking down and suppuration, a purulent condition of the pericementum and membrane all about it, in which I have never found any deposits.

While I am upon my feet, I wish to say that I have been somewhat enthusiastic concerning the Brophy operation, because I believe it is a great advance in surgery. I think every dentist should thoroughly and promptly comprehend that as the Great Physician originally anointed the eyes of the blind and they saw, so now modern oral surgery touches the lips of the dumb and they speak. I believe the miracle which cures the dumb is as profound as that which opens the eyes of the blind, and for the first time within my knowledge cleft palate can be positively and radically cured by modern surgery. It is done by an operation that is entirely new and original, by the forcible breaking down, bringing together, and union of the osseous walls, after which the bringing together of the edges of the soft palate is easy, for they have already been approximated by bringing together the hard palate. Dr. Brophy is my friend. He is none the worse man for that. I do not know that he is any better. I do not speak of it on that account. I beg of you not to believe there is any personal consideration whatever in this. I do not suppose that any of you do; but I tell you, gentlemen, it is a grand triumph of our profession and of oral surgery when it can, for the first time, overcome difficulties which before have never been obviated, and restore the child and the man to the ranks of manhood and to the full useful

ness of a human creature. I wish that every one comprehended it. Professor Brophy performed his four hundred and ninety-fifth, four hundred and ninety-sixth, and four hundred and ninety-seventh operations in Buffalo a week ago yesterday. Having for so many years observed these cases, and having seen the triumphs that have resulted from this operation, I had no fear of the result except in one case, the subject of which is since dead,—the first case, I believe, that he has ever lost,—the death in this instance being from a cause not attributable to the operation.

Relative to the paper of Dr. Thompson, I want to say one thing. There is one point on which I cannot agree with him, and that is that the function of the teeth is the mastication of food. It is not the primary object of the teeth. In man, in the species Homo, it is undoubtedly the primal object. In his order, that of the primates, it is probably very important, although it is not primal in some of the species of the order. Outside of the class of mammalia it loses its significance, and when we get back to the other classes of the vertebrates, and to other orders of the mammalia, we find that the first and greatest of the uses of the teeth is as weapons of offense and defense. Gentlemen, we elevate man a little too high. He is first in the great order of creation. Under the divine guidance of the Supreme Being he has developed far beyond any other of the species, but when we come to consider the subject of comparative anatomy in its broad sense, not restricting it to the mere dental organs out of which we get the butter for our bread through their manipulation, when we come to look at the subject in its general sense, then we find that the great end and aim of the teeth first of all in the broad scheme of creation is as weapons of offense and of defense. The second office in importance is as organs of prehension. Then comes the office of third importance, as organs of mastication; but remember that comparatively few of the species of the various orders of the different classes in the grand divisions of the vertebrates and invertebrates use the teeth as organs of mastication at all. We find the teeth not only upon the tongue, but they are scattered through almost the whole of the digestive tract in certain of the orders. Hence, Mr. President, in the consideration of comparative dental anatomy, I would have all dentists rise to a higher plane and consider the subject from a more general standpoint than that of the dentist.

DR. BROPHY: I am informed by my friend, Dr. Goddard, that in speaking of the opening of the antral cavity, I stated that I would make it through the incisive fossa. I intended to have said the canine fossa.

DR. M. C. SMITH: If I am in order, I would like to make a motion right here that this Association invite Dr. Brophy, of Illinois, to read a paper at our next annual meeting on the subject of the surgical operation for cleft palate, and at the same meeting we have a paper on the same subject by Dr. Fillebrown, as I know that he has had marked success in operating on cleft palate. I have seen some of his patients, and I can truthfully say that he has met with marked success.

DR. BARRETT: If the gentleman had been here last year, he would have heard one of these papers.

[The motion of Dr. M. C. Smith was agreed to.]

DR. BROPHY: In accord with the wishes of the Association, I will endeavor to bring before it, at its next meeting, if within a radius of five or six hundred miles from Chicago, some patients, four or five of them, who were operated upon within the first two or three months of their lives, so that the members may have an opportunity to judge of the merits of the early operation for cleft palate.

DR. M. C. SMITH: I would like to say a word or two in regard to opening the antrum. Any general surgeon can open and treat the antrum by making an immense opening into that cavity. It remains for the dental surgeon to use conservative measures. I think the first thing in antrum trouble is to make a diagnosis. If the diagnosis is clear that it arises from dental irritation, I do not believe in making a large opening. Evacuate the pus, which can easily be done through a root-canal of any of the teeth that enter into the antrum. Remove the cause, which consists in treating the dead tooth, and your patient is cured without making a large opening into the antrum.

DR. PEIRCE: I say amen to the last speaker's remarks. I think many of these antrum cases which come into the hands of the dentist are entirely due to previous dental irritation. The day I left home I dismissed a patient who came to me suffering a great deal of pain with a much irritated antrum. I diagnosed the case as resulting from a previously diseased tooth. The antrum was

treated through a small opening made through one of the sockets of the buccal roots. The day I left home I dismissed this patient as cured, though the case had been very offensive and painful. I think when Dr. Brophy made the remark about a very large opening, he should modify it with a statement that it would depend upon the diagnosis. A moderate opening will answer our purpose very well in many cases.

Now, one word in reference to Dr. Barrett's criticism on Dr. Thompson. I am sorry Dr. Thompson was absent when the criticism was made. I will say to Dr. Barrett that in a large majority of animals the teeth are preassimilative organs, subserving nutrition, notwithstanding the fact that they are also organs of offense and defense in some of the higher animals. The primitive condition was a specialized dermal cell for the protection of the mucous membrane.

DR. CRAWFORD: I am very glad of the request to Dr. Brophy and Dr. Fillebrown to present papers next year. I shall be very much interested in the further development of that subject.

I have a very high regard for Dr. Barrett, but I must say that I do not believe a very thorough and reliable and critical investigation would class the human teeth as organs principally of offense and defense, and I throw it out as a suggestion that that view of the matter will, in my judgment, not only have a bad effect upon the further study of this question from the standpoint of the dentists, but it goes into the very life and support of that character of civilization which we are maintaining in *statu quo*, that condition of things that will enable us to perpetuate ourselves.

Now, about this antral trouble, I do not believe there is an affection that the human being is subject to about which there are so many mistakes made in diagnosis. In the affections of these cavities known as antral, such as the frontal cavities, the antrum, the mastoid portion of the temporal bone, and the maxillary sinus, in and around that part of the mouth,—and they are to be found sometimes in the lower jaw also,—I say in the discussion of the pathology and diseases of that region I believe that mistakes of diagnosis are very frequently made. In my limited experience I have seen no less than five cases of openings into the nasal cavity diagnosed and treated as antral trouble. And three of these cases, in addition to being under the observation of surgeons and physi-

cians of reputation, had dental surgeons associated with them. Within the last five weeks I was called in the case of a lady who had a peculiar discharge in the nose. The previous history rather indicated antral trouble. A careful physical examination on the lines of exclusion precluded the involvement of the antrum of Highmore. We cannot go into the discussion of this to any extent without being involved in its etiological aspect. I believe there are some gentlemen present here who were present when I took the position before a medical society that at least seventy-five per cent. of cases of empyema of the antrum of Highmore were attributable primarily to some form of dental trouble. I did not have a supporter on that floor seven years ago. I am glad to say that there has been a change of opinion on that subject since then. If I understood Professor Brophy aright, he said that you should always make a large opening into that cavity?

DR. BROPHY: No, I did not say that.

DR. PEIRCE: He said so.

DR. BROPHY: If I may correct the gentleman, in chronic cases a large opening should be made. That is all I said. I did not refer to the primary disease, which might be dependent upon a simple alveolar abscess. In such a case of course you should remove the cause of the trouble and treat it in the simplest way. But in chronic cases a large opening should be made.

DR. PEIRCE: You did not use the word chronic.

DR. BROPHY: I refer to the record.

DR. BROWN: I thought only chronic cases were under consideration.

DR. CRAWFORD: Dr. Brown called attention to a remark that I made. I want to coincide with Dr. Barrett in reference to that matter. I believe that in the large majority of cases the vigorous washing and douching of the cavity do more harm than good. Even in some cases that are supposed to be chronic and prolonged, the best course to be pursued is to leave the cavity open, meddling with it as little as possible.

DR. PEIRCE: Dr. Thompson made allusion to my friend, the late Dr. John A. Ryder. I desire to say that in 1878 I read a paper before this Association, that was subsequently published in the *Dental Cosmos*, in September of that year, giving a concise synopsis of Ryder's paper on the mechanical genesis of tooth-

forms. It was the most remarkable essay ever published, and still is the only one published upon this subject. Any one who wishes to see Dr. Ryder's statements and theories regarding tooth-forms can do so by referring to that number of the *Dental Cosmos*.

DR. THOMPSON: I feel obliged to take issue with Dr. Barrett in regard to his statement of the primary office of the teeth. What he has said is liable to mislead. As Dr. Peirce has well said, students of dental anatomy have found that in the first and lowest types, the teeth were evolved principally for the protection of the jaw from the attrition of mastication, and the teeth have been gradually evolved by the development of the scales of the skin. So it has proven all through the study of the teeth of all types of animals that their first and primary office is the reduction of food, and they therefore belong to the nutritive system. That they are further and specially developed as weapons is secondary and not primary. I think if Dr. Barrett will look into the subject in that way he will find that he is in error.

In regard to Dr. Walker's paper and the subject of which he speaks, it is one upon which we need a great deal of light, and the study of comparative anatomy will throw much light upon it. I wish now to extend my thanks and congratulations to Dr. Walker for the work he has done on the subject of the occlusion of the human jaw. He has done good work. I wish further work might be done in this direction, but I wish also to urge that a great deal of light can be obtained from the study of animals, in which the function is much more elaborated and much more highly specialized.

DR. BARRETT: One or two questions have been asked of me which show that I have not made myself clear. One of these questions was asked by a man who has as good a right to know as anybody. Professor Brophy can answer better for himself. This operation which is referred to, which Dr. Senn calls the "Brophy operation," and which he pronounces the greatest advance of surgery of the decade, is entirely an original operation. It never was performed before Dr. Brophy performed it. It is called the "Brophy operation" because it is entirely separate and distinct from anything that has ever been performed before, so far as my knowledge goes. It has nothing of the staphylorrhaphic operation in connection with it in any way, but is radical in its nature. I am asked at

what age Professor Brophy performs it. Within a week of birth, if possible, that he may take the tissues and unite them and have them commence their development as soon as possible. He will correct me if I am wrong. He is much more competent to speak of it than I; but that operation is applicable usually only to young children, and is not even then applicable in every case. That is, there might be such a condition as would make some other operation possibly better, although it is applicable, I believe, to most of them. It consists in bringing the edges of the palatal process forcibly together and suturing them in apposition. They must be broken down to do it, and when the individual is so old that it becomes too great a risk, then of course the operation is no longer called for. The operation then is entirely original, never having been performed before he performed it, and, as I say, it is radical in closing the hard palate. It is best performed, I believe, within the first eighteen months.

DR. BROPHY: In answer to the question, I would state that within the first three months is the best time. When the child is between ten days and three weeks old, the parts are most favorable to operate on, and at that age the operation will not be followed by the degree of shock which would occur later.

DR. BARRETT: But not applicable after eighteen months?

DR. BROPHY: No, after the first year it is not easily accomplished. It might be done, but it is far more difficult to accomplish. The bones have been ossified and the teeth have in part been erupted, and the difficulties connected with bringing the parts together are much greater than in early infancy. That is why I urge the performance of the operation in early infancy, allowing the lip to go until the palate is restored, as the operation of closing the lip is a comparatively simple one.

DR. CRAWFORD: Dr. Brophy has made a success of this, and I want to congratulate him. I want to make a prophecy here that he will be able to close these clefts much later in life than he has already done, up to twenty-five or thirty years.

DR. MCKELLOPS: The Section on Clinics has no report to make. No applications for clinics have been made to us.—I wish to call attention to the De Trey gold. I think I have used every kind of gold that has been made, and I find this most eminently satisfactory.

DR. PEIRCE: I should like to ask Dr. McKellops if he has used gold of a similar character manufactured by Morgan & Hastings?

DR. MCKELLOPS: I have used all the kinds of gold that have been made, and I am pretty well satisfied that with the De Trey gold I can accomplish any results as well as with platinum or anything else.

SECTION IX.

Orthodontia.

REPORT BY V. H. JACKSON, CHAIRMAN.

THE Section was duly organized and received three papers, two of which were thought not properly to belong in this Section. One was referred to the Committee on Voluntary Essays, and the author of the other was advised to present his paper before the Society of Technique. The Section recommends to the Association a paper by Dr. C. S. Case, of Chicago, entitled "Answer to the Criticism of My Paper, entitled 'Principles of Force and Anchorage in the Movement of Teeth.'"

SECTION IX.—Continued.

Answer to the Criticism of My Paper, entitled "Principles of Force and Anchorage in the Movement of Teeth."

PAPER BY C. S. CASE, OF THE SECTION.

AT the last meeting of the American Dental Association I presented a paper relative to the scientific application of force in the movement of malposed teeth, some of the conclusions of which did not coincide with the views of a number of prominent dentists who took part in the discussion, while a few particularly criticised, as of no practical or scientific value whatever, a principle which I consider one of the most important of my practice,—a principle upon which are founded methods that have enabled me to accomplish that which would have otherwise been impossible, and one, moreover, that is based upon the most simple and well-established laws of physics, and certainly as true when force is applied with a dental regulating apparatus as under similar conditions elsewhere in mechanics.

Had I anticipated this at a meeting of representative American dentists I should have been prepared, as I am to-day, with apparatus to practically demonstrate its truth, and also with models which speak for themselves of its value, and which but fairly represent hundreds of similar cases in my practice.

As it was, with nothing to demonstrate the practicability of my claims, the discussion resulted in a controversy of opinion alone, which left the members present and the profession at large divided in their opinions of the practical value of my methods in general.

My object in bringing this question before this body is, first,

to endeavor to conclusively establish the truth and value of my claims; second, to correct a slight and practically unimportant error relative to the laws of physics contained in my paper, the incorrectness of which was not even questioned at the time; and, third, to take up certain questions which arose in the discussion that I did not answer.

First. The question referred to which occasioned the principal controversy was in regard to the action of force when applied to a rigid bar, or extension, above the gingival margin of the crown; my opponents claiming that when force is applied at "A," Fig. 1, in the direction of the arrow (see Fig. 2), it will have the same effect and produce the same movement of the tooth as when applied at "B," or at that point where the bar comes into actual contact with

FIG. 1.

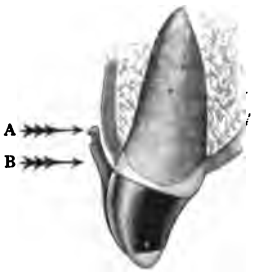


FIG. 2.

the tooth; their opinion being based upon the fact that the force must first be transmitted down the bar to the crown before any action can take place.

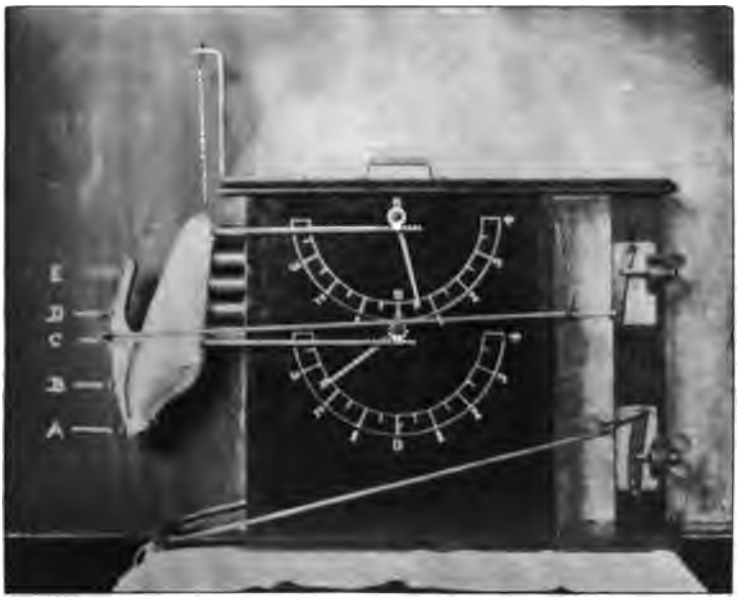
This was to controvert the practicability of several methods which I introduced for distributing the force over a greater area of the root, for the purpose of decreasing the tendency toward tipping the tooth. These methods were based upon the principle that when force is applied anywhere upon a bar or extension, above and on the outside of the gum, made rigid with the crown, it will have exactly the same effect as when applied to the root itself at a point on a line with the direction of said force.

In order to place this claim beyond further controversy I have constructed an apparatus which, as you can see, consists of a large wooden tooth that is suspended in an upright position by being attached along the posterior surface of its root to five steel spiral springs, which in turn are fastened to and supported by a frame.

(See Figs. 3 and 4, the latter showing the reverse side of the apparatus.)

These springs are made exactly alike, and so adjusted that a given power applied to each separately will produce the same amount of motion in compression or extension. To avoid a slight difference that might be caused by the springs in motion impinging upon the frame, I have surrounded each with a loosely-fitted, lubricated brass tube, or runner; and to further prevent friction

FIG. 3.



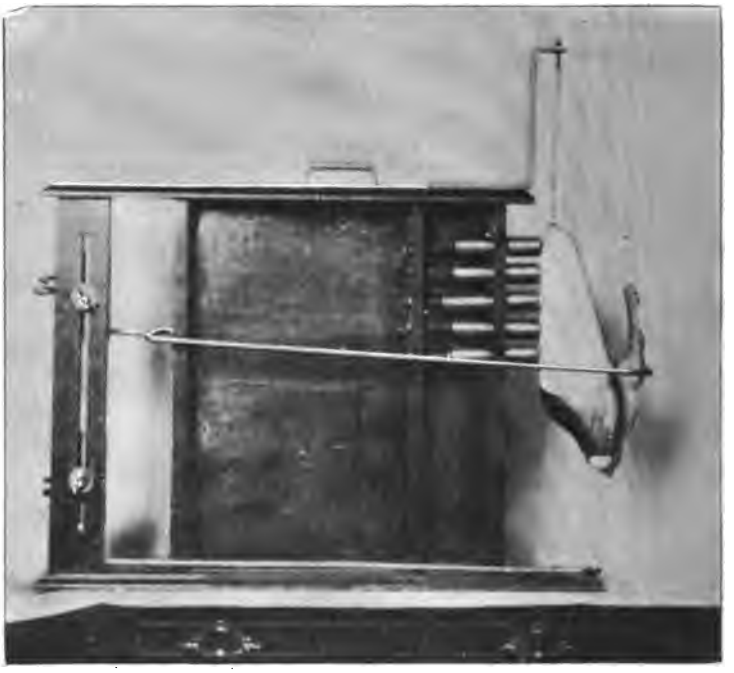
upon the runners, that would be caused by the weight of the tooth and its moving apparatus, I have suspended it to an overhanging arm.

My object in the construction of this apparatus has been to hold the root of the artificial tooth in the grasp of a medium and uniform elasticity, so that when force is applied to it in a manner similar to that which is possible with a dental regulating apparatus, its movement or motion in this medium will exactly represent the direction and approximately the relative amount of energy expended at different locations on its root.

In order that this movement may be seen by all present I have extended two arms, one from the apical and the other from the cervical portions of the root, which are made to move hands on dials in the same direction that that portion of the root moves, but with magnified motion.

To the front of the tooth I have attached an upright bar, with an extension that is longer but somewhat similar in shape to those

FIG. 4.



used in a contouring apparatus. This is furnished with notches at different points for the attachment of power bars.

With this explanation of the apparatus we will proceed to apply the power, first at C, Fig. 3, or the highest point upon the crown that would be possible with an ordinary appliance, and which you were told in the discussion of my paper will produce the same effect as when applied anywhere above this point, upon a rigid extension bar similar to this one.

The movement of the hands upon the dials shows that the tooth

at once tips from an upright position, the cervical portion moving in the direction of the applied power and the apical portion moving about one-fifth as far in the opposite direction. (See Fig. 3.) In this act, as explained in my paper relative to the movement of teeth with power applied at one point upon the crown, we are working a lever which combines the qualities of the first and second kinds of levers. The areas of resistance, which we may consider as interchangeable areas of fulcrum and weight, act reciprocally as fulcrums to each other.

If, now, we apply power above this point upon the extension bar we soon come to a place (D, Fig. 3) where the end of the root ceases to move in the opposite direction and remains stationary, as a pivotal point to movement in other parts, while the tendency toward inclination is very much removed.

Again, when we apply power (upon the upright bar) at a point, for instance, whose line of force will intersect the root in the center of its area of resistance (E, Fig. 3), we find that the whole tooth moves in an upright position equally in the direction of the force, because we have in reality applied power upon a bent arm of a lever of the third kind at a point that is equally distant from points of equal resistance.

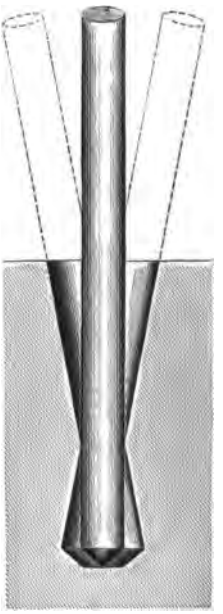
I think, now, you will agree with me that force acting upon a bar made rigid with the crown, and extending in front of the gum, will produce the same effect as if applied to the root itself, or the same, if you please, as if all the space between the bar and root were one solid piece, a condition that can be easily proven by placing in this space a piece of wood that has been made to exactly fit it. If we now apply force to the bar, or, if you please, to the wood near to the root itself, at a point on a line with the force that was last applied on the bar, we find that the result is the same.

Please understand that I do not claim that a natural tooth will move exactly in this way when force is applied in a similar manner, for that must always be governed more or less by the varying stability of its surroundings, and influenced largely by the size, shape, and number of its roots; whereas the demonstration of these principles is intended to show only, as I have said, the direction and approximately the relative amount of force that the root can be made to exert upon its surroundings, with a tendency—always —toward proportional movement.

And the practical application of principles of dynamics, so far as we can utilize them, is, in my opinion, the only scientific course for us to pursue in the practice and teaching of orthodontia.

Second. In my paper, with a view to showing the relative force exerted by different portions of the root of a tooth, when power is applied at different points upon the crown, I used the example of a post driven one-half its length into clayey soil of uniform quality. (See Fig. 5.) I said, "If you take hold of the

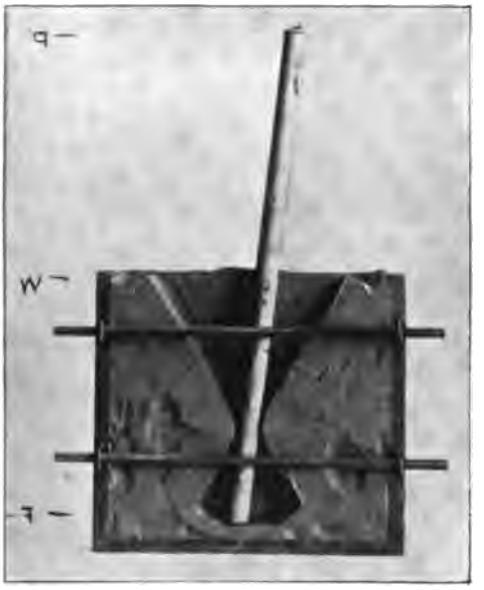
FIG. 5.



top of the post and move it back and forth you will be working a lever which combines the qualities of the first and second kinds; or one like the oar, in which the so-called areas of fulcrum and weight each act as a fulcrum to the other. As the post is forced in one direction the clay along the upper area will be impacted or thrust to one side, the whole acting as a lever of the second kind, with fulcrum at the lower end. At some point, however, the clay will cease to move in the direction of the applied power, the resistance over the so-called area of weight causing *it* in turn to act as a fulcrum and the whole as a lever of the first kind, performing work,

or movement of the clay, at the lower end of the post in the opposite direction." I will now show you practically the action of a post as described. Instead of driving the post into a mass of clay, as described in the text, which would obscure the movement of the imbedded portion, I will force it into an even surface of clay and secure it with cross-bars, which will prevent it from slipping out while I move it back and forth. (See Fig. 6.)

FIG. 6.



I further said (and right here is the error I wish to correct), "The reason that the movement at the upper area of work or weight is twice that at the lower (I should have said *about* twice that at the lower) may be found in an examination of laws which refer to the relations of the three factors of levers. Considered as a lever of the first kind, if the fulcrum, or surface area, is exactly in the middle of the lever, the force exerted upon it will be equal to the sum of power and weight, or twice as great as that exerted at the lower end, or area, of weight. Again, when considered as a lever of the second kind, the area of weight now being between, and at an equal distance from, power and fulcrum, it would be

forced to receive a pressure equal to their sum, or twice as great as that exerted at the lower end, or fulcrum area."

While this statement is not quite correct, it is sufficiently so for the purposes for which the example was used, as you can see by the shape of the hole I have made in the clay, and also by the machine, when I come to apply the power at the incisal end of the tooth; both the clay and the machine working similar to the ordinary levers of the first and second kinds.

However, being loath to make a scientific statement that is not correct from the standpoint of mathematical physics, however unimportant the difference may be to us practically, I wish now to say that if it is desired to show by the movement of the post the exact amount of energy it exerts along every point of its surface that is imbedded, we must assume that it is surrounded by a medium that is absolutely and unchangeably uniform throughout in elasticity and resistance to motion,—a medium, moreover, that is purely hypothetical but nevertheless necessary for correct mathematical calculation.

Under these conditions, that are not fulfilled with any ordinary medium, and especially dissimilar to a tooth situated in the alveolar process, it is not difficult for any one to see that the influence of the intervening medium between points F and W (Fig. 6) would raise the pivotal point of the post somewhat above two-thirds the depth of the hole when power is applied at P, and consequently the point F will travel in the opposite direction a trifle more than one-half that at W.

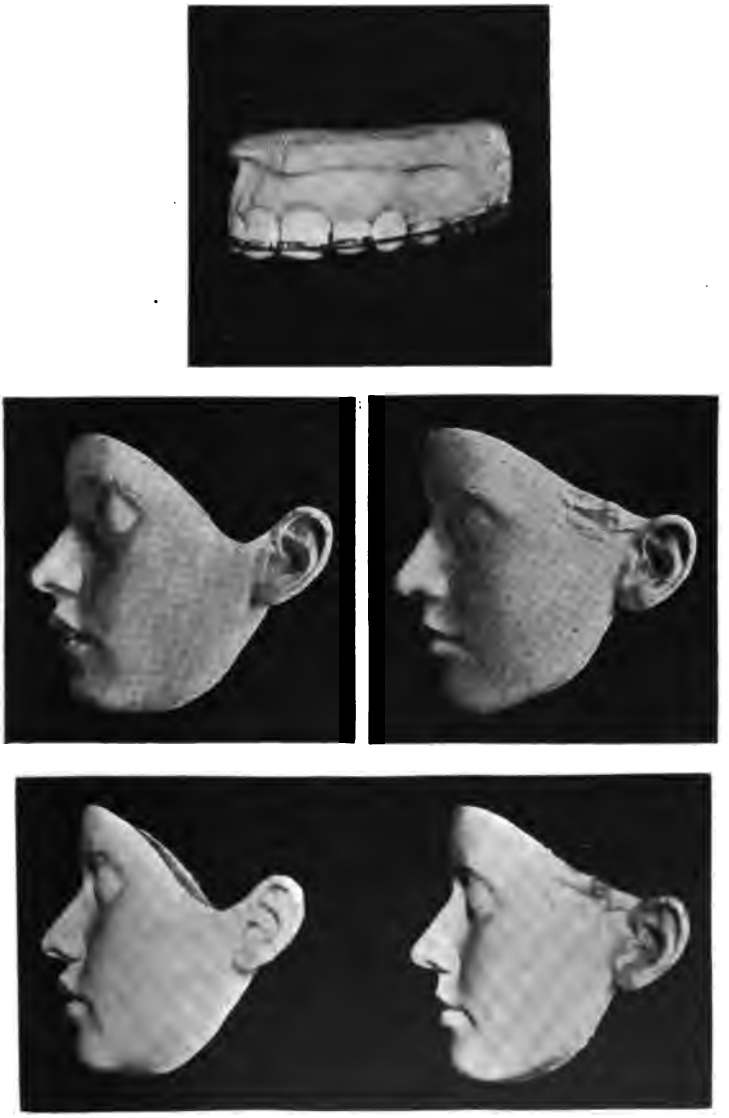
An important fact to *us* is, when we apply power at different localities upon the exposed portion of an incisor tooth, the relation of force exerted at different portions of the imbedded end is practically maintained as in the ordinary lever.

For instance, if the power arm is one-half the length of weight arm, or if we apply our power at the middle of an incisor crown, as at B, Fig. 3, about three times as much energy will be exerted at the cervical portion as at the apical. Again, if the weight arm is one-fourth that of the power arm, or if our power is applied as near to the gingival margin of a tooth as is possible with an ordinary appliance, as at C, Fig. 3, about five times as much energy will be exerted at the cervical as at the apical portion.

It will be remembered that I used the example of the post solely

to show *approximately* the probable relative energy expended on the walls of the alveolus, at its margin and apical portion, when power is applied at different points upon the crown. I wish to

FIG. 7.



make that as emphatic as possible, because I find that most writers on orthodontia do not seem to appreciate this very important and valuable principle.

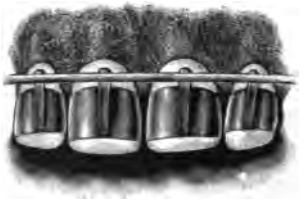
For instance, when the crowns of the anterior teeth are to be retruded, if it is desired to slightly protrude the ends of the roots at the same time, with a view of giving a fuller contour to the upper portion of the upper lip and naso-labial depressions, power should be applied at the extreme incisal ends of the crowns. This principle is well illustrated by the models of a case in practice. (See Fig. 7.)

On the other hand, if little or no forward tipping of the roots is desired, force should be applied at the gingival border.

I explained in my paper how I soldered to the bands upright bars that were grooved at their upper ends to receive the retruding

FIG. 8.

FIG. 9.



wire, and to permit it to span the interproximate gingivæ, while applying the force at the highest point possible upon the crown. (See Figs. 8 and 9.)

When force is applied in this way to the upper incisors it will be found that the line of direction of the force is even with, and often above, the cortical layer at the posterior walls of the alveoli. Consequently, if the roots are short, and the surrounding process quite yielding, they will be carried back bodily without recourse to other means.

I explained also how I extended these upright bars above the gingival border, as in Fig. 2, with a view of increasing this tendency.

It was this particular scheme, and the drawing I used to illustrate it, that brought out the attack upon a principle which I think all must now acknowledge is as true as it is important.

If it is desired to apply a greater force than is possible in these

ways toward moving a tooth bodily backward or forward, an independent fulcrum should be introduced in the construction of the apparatus. This, as I shall attempt to show by the machine, should give you complete control over the movement of different parts of the root.

Third. In publishing my methods for the scientific application of force in the movement of malposed teeth, it has been with no intention, as some of the friends of other systems seem to think, of lowering the general estimate or standard of other systems, but rather to elevate them. For, if these principles are practically true and valuable, as is proven by these models I here present for your examination, which represent every variety of dento-facial irregularity, then you should be able to apply them to the system you prefer. If not, and you aspire to accomplish greater good, it must give way to a system which will permit greater possibilities.

There seemed to be, on the part of a few, an unfortunate misunderstanding, or intent to misconstrue, the contents and purposes of my paper. I think any one who will take the trouble to read it will find that it is confined almost entirely to the principles involved in the *teaching* of orthodontia, with a description in general of the course which I attempt to pursue.

The only place I deviated from this was relative to stationary anchorage appliances. I said, "In a single paper it will be impossible for me to enter into a detailed description of the various methods I employ and teach for the application of force in all branches of this work, but in order to give you an idea of its scope I will as briefly as possible describe specifically the methods and principles involved in the construction and application of static or stationary anchorage appliances;" which I proceeded to do, confining my remarks strictly to this particular style of anchorage. There was no reason, therefore, for the attempt that was made to convey the impression that this was the only way I obtained a base of reaction for the movement of malposed teeth, or for the remark that the methods I described should be considered among the curiosities of literature rather than things of practical value. I would be pleased to have this gentleman stand at my chair and see every one of the forty or more cases I am at present treating. Of the number who visit me daily he would see a great variety of methods for obtaining a base of anchorage for protruding and re-

truding the anterior teeth that were not mentioned in my paper. He would see a number who are wearing skull-caps, taking advantage of a method in cases that demanded it, which he referred to "as a somewhat old method, introduced so long ago now that it seems that some of us have come to almost forget it." He would also see a variety of schemes for utilizing the stability of anterior teeth to sustain molar anchorages, which he mentioned; also where the posterior teeth of one jaw are used to protrude and retrude the anterior teeth of the other, and other things in this branch, all of which I considered hardly necessary to the theme of my paper to even mention.

The fact that there is at present quite a general objection to the employment of so many bands encircling the teeth, and the necessity of separating the teeth sufficiently for their attachment, I can attribute only to a lack of experience in adequate means and methods.

Dentists do not object to making wide separations for fillings, even though it is accomplished with considerable difficulty and suffering, because they know that the teeth soon return to close the space. And yet, for fitting bands, it is rarely necessary to do more than leave a piece of waxed tape between the teeth over night, which causes very little suffering beyond a slight tenderness of the teeth; and in the majority of cases even this is not necessary. After the bands are removed, also, though they be worn a year, *the spaces soon close.*

I believe if I could show practically this branch of my practice, the ease with which it is accomplished, and its general applicability, all objections to it would be removed.

The bands I use are prepared in my laboratory with the greatest care and accuracy, in order to obtain the proper degree of malleability and finish. These are rolled to exact sizes, which range from three to ten thousandths of an inch in thickness, and of different widths. Bands that are above four thousandths of an inch in thickness are used only for constructing stationary anchorage appliances, and when a long and rigid bearing is required.

The bands that I use principally are three and three and a half thousandths of an inch thick.

When it is remembered that five thousandths, or No. 36 B. & S. gauge, is the thickness of ordinary ledger paper, it will be seen at

once that the objections to the separations commonly necessary are of no importance whatever, especially as the spaces soon close of their own accord after the apparatus, or retainer, is removed. This is hardly in accord with the remark made by one gentleman, that, according to his ideas, my finished cases in his practice would require regulating to close these separations.

Another gentleman criticised my practice of fitting the bands accurately to the teeth, claiming that, inasmuch as we depended upon the cement to hold the band in place, the cement should not be forced out by a closely-fitting band.

I think if he were to repair a piece of broken glass or earthen ware, or make a lasting wood glue-joint, he would be very careful to bring the parts into perfect apposition, even though it forced out all the excess of uniting material. And the same rule is true of bands cemented to the teeth. Those which are the most accurately fitted, provided the cement is of the proper consistence, are by far the most lasting and difficult to remove.

DISCUSSION.

DR. H. A. SMITH: I want, very briefly, to refer to a case recently finished very satisfactorily by Professor Case, and to call attention to the importance of consultation in like cases coming under our observation. If we feel that we are not competent to treat those cases after consultation, it is highly important that we should refer them to some master in the art of orthodontia. I hold in my hand the models of a case which had been treated by two or three practitioners, and after the parents supposed that nothing further could be done, they hunted for further advice in the matter. Some one inadvertently referred them to me. After I had made a study of it, I concluded that the dentists who had been treating the case had put the work upon the wrong maxilla. As shown here in the model, there was a depression at the region of the inferior incisors. The practitioners who had treated the case had put the work upon the superior maxilla, had attempted to retract the superior teeth. It occurred to me that that was a wrong thing to do, that the work should be put upon the lower maxilla. I said to the father, who was a surgeon, "I think there is one man in the United States who can settle this matter for you." I modestly said to him, "I think your dentists at home are putting the work on the wrong

jaw." He said, "Will you please give me the name of the man who knows about this?" I wrote the name of Dr. Case upon my card, and this gentleman immediately went to Chicago with his daughter and consulted Dr. Case, and it seems that I was right about it. Months were wasted in the treatment of this case by putting the work where it was absolutely objectionable. The study of facial contour is most important, and it seems that some of us at least cannot recognize what is necessary to be done. Hence, a man like Dr. Case should be consulted. An examination of these models will show that he has done phenomenally for this young lady. I have not seen her since the case was treated, but it seems that the advice which I gave to go to Professor Case was followed by a splendid result, as shown by these models. Occasionally the youngest practitioner will undertake a case of this sort and blunder along and perhaps do more harm than good. I speak now of extreme cases. Ordinary cases of irregularity can now be treated very intelligently by the younger practitioners. The case to which I have referred was treated for months by experienced practitioners, and yet they were all going wrong. I simply want to call attention to the errors which are sometimes committed in this direction, and suggest a way whereby they may be avoided.

DR. MARSHALL: Mr. Chairman, when Dr. Case had this subject before us a year ago, I felt that he had made a mistake in his interpretation of the law of levers, as represented in Fig. 1, and I think I so told him at that time. He has, however, made a complete convert of me to-day by his demonstration with the model. He is entirely right about the matter, and I desire to make this public statement of my conversion to his system.

DR. GUILFORD: Mr. President, in discussing this paper, I simply wish to discuss the principles involved and their application. First of all, I would remark in regard to Dr. Case's work, as I said last year, that I am perfectly satisfied with it. He has brought out good ideas, has put them into practice among his patients, and accomplished excellent results. He knows and will confess that I admire his work as much as any one.

Dr. Case said that he prepared the present paper on account of certain criticisms that were made on the paper that he read before this Association last year. His paper this year was intended as a reply to those criticisms and for the purpose of establishing

certain positions or points that he took at that time. In regard to the criticisms of his paper last year, there was one criticism that was made, concerning one principle involved, in which he was correct and the others were wrong. But in regard to certain other points that were criticised, he was undoubtedly wrong and others were right. Perhaps those of you who were then present will remember that he used the illustration of two men carrying a bucket of water on a pole, and spoke of it as a lever. I said that the pole under such circumstances is not a lever, and I can show you, I think, that it is not, and that the illustration is not a good one. In the use of a lever we must have three conditions: a weight or resistance to be moved; a power applied to it to change the position of that weight or resistance, and a fixed point or fulcrum. The fulcrum may not be absolutely fixed, but as much so as anything can be in this world. Now in his illustration he represented a pole with two men carrying a bucket of water suspended somewhere on that pole. In one case it was in the middle, in which case each man would bear an equal part of the burden. In another it was nearer one end, and then the individual at that end would bear the greater proportion of the burden. In the other case it was nearer the opposite end, and in that case the other one would bear the principal burden of the work. The relation between them is perfectly established by the laws of physics, but I said they were not levers because there was no fulcrum there. To make a fulcrum of a thing of this kind one end would have to be held still and the other one moved in one direction or the other, but as long as the weight was carried between the two it was simply a question of which individual carried the greater portion of that weight, and not an illustration of the lever.

The reason why some of the criticisms were made upon Dr. Case's paper was because the paper was not fully understood. Dr. Case said last year that the object of his paper was to show his method of teaching orthodontia, and that it was according to correct scientific principles. He also said that other teachers of orthodontia differed from him in that respect. In other words, he declared that he was not like the majority of teachers of orthodontia, because he taught it upon correct scientific principles. In the course of his paper he used a number of terms which were absolutely unscientific, and that led to a good deal of confusion.

For instance, he spoke of a fulcrum area. There is no such thing. There is no fulcrum area. The fulcrum is a relatively fixed point, not an area at all. He spoke of static anchorage. There is no such thing as a static anchorage. There may be a secure anchorage, a fixed anchorage, or something of that kind, but it is never known as a static anchorage, and that led to confusion. He spoke of a mechanical fulcrum. I could not make out what a mechanical fulcrum was, and have never been able to find anything of that kind. When he spoke of a static fulcrum, I suppose he meant a fixed fulcrum. Then he spoke of a certain instrument combining the qualities of the first and second kinds of levers. That is an impossibility, according to physics. You can have a lever of the first class, a lever of the second class, a lever of the third class, but you cannot have a lever combining two classes. It may act as a lever of one kind at one point and then, by changing its relation, it may act as a lever of another kind, but it cannot do both at the same time. He spoke of the *area* of weight and the *area* of fulcrum. Then he used the words "weight" and "work" interchangeably, while weight and work are entirely different things. Weight is the resistance which is to be overcome. Work represents a certain result produced by the expenditure of a certain amount of energy, a matter somewhat difficult to explain, which I will not stop to do here.

Now, in regard to the buckets and pole of which he spoke, I use the illustration which I have on the blackboard here to-day. [Referring to diagram.] In the illustration he represents two springs, and then he represents a weight there, to show the relation between the two. Now there is no fulcrum there and consequently it is not a lever. You can have one spring and a weight, but you must have a fixed point. You cannot have a lever without it, consequently those two illustrations are misleading.

Then in regard to the post in the hole, reasoning from this in regard to the changeable position of the weight and supposing that they were levers, and bringing out the law associated with that matter, he applied it to the post in the hole. Now, when you put a post in a hole in clay or in sand, and move it backward and forward, you will get a result something like this [illustrating]; that is to say, a hole wider above and wider below, but as to stating just where the point is upon which that post revolves in making its

motion,—in other words, where the fulcrum is,—that is impossible to tell. No one living could take a box of clay and say, "I will put a post into that to a certain depth and will move that post, and the fulcrum will be at this or that particular point." You can take a box of clay and put a post in it and move it as I am doing, and you can find by that experiment just where the central point is, and you can draw a comparison between the length from that point to the bottom and that point to the top, and find that one bears a certain relation to the other. But as for telling that in advance or laying down any rule, it would be an impossibility. Then, again, Dr. Case, in one of his papers last year, said that if you take a pole four feet long,—it does not matter about the length, but I think he said four feet,—place it two feet deep into clay, and then apply power at the top of that pole, you would get a fulcrum at a certain point, but if you applied the power half-way between the top of the pole and the edge of the surface, the fulcrum would be at another point. Now that is entirely erroneous. It does not matter where you take hold of that pole. The opening that it makes in the clay will be precisely the same. The amount of power that you have to apply varies, but the relation of the pole to the ground does not vary at all.

DR. CASE: Will you please state that proposition again?

DR. GUILFORD: I say you stated last year that if you take a pole four feet long and put half of it in clay and half of it above, that if power was applied at the top and the pole moved, your fulcrum would be at a certain point in the clay, but if you applied it half-way down the free end of the pole, it would be at a different point. Do you remember that?

DR. CASE: Go on.

DR. GUILFORD: Now, I say that is erroneous, because it does not matter where your power is applied. If you apply the power lower down, you will have to apply more power in order to overcome the resistance of the clay, but the result in the clay will be the same if you apply it at the top or half-way between the top and the surface of the ground. So that was another error. As I said a moment ago, so unreliable is this matter of putting a post in clay —and clay is as convenient a thing to use as anything else—that in performing the experiment a number of times you will get different results. During the past year I took a mass of clay and

used it in experiment after experiment, confining it on four sides in a fixed box. After inserting the pole and moving it back and forth, the box was removed and the clay cut in two through the hole. In each case, although it was the same clay, used under the same conditions, with the same post, the point here that is commonly known as the fulcrum varied quite considerably.

Dr. Case said to-day that last year he made but one error in his paper, and that an unimportant one. It consisted in saying that the distance from the bottom of that pole to the fulcrum was just one-half what it was to the top. Is that right?

DR. CASE: Yes.

DR. GUILFORD: And that he found it was a little more. Now, in making the measurement here to-day the upper part is not only twice as long as the lower part, but exactly one inch more. That does not matter particularly. I simply bring that up to show that you cannot establish the relation between the two parts. It is liable to variation in every experiment you make. More than that, the principle involved in the bearing of the weight does not apply to this. You cannot draw a deduction from that and establish the point at which the fulcrum will be located in this.

One other point, and that is that this illustration in the clay is a very poor illustration of a tooth in its socket. If the tooth in its socket were surrounded by the same kind of tissue at all points, then the illustration might be a good one; but unfortunately such is not the case. A little anatomical examination of the tooth in its relation to the alveolus will show that the cortical layer of the process is a very dense structure, and it is also comparatively thick. It is thin right at the gingival margin, but it is thick above and in some cases gets very thick as it goes deeper. Now, in the movement of a tooth you compress the tissue and break down the bony cells and the tooth is readily moved; but when you come near to the cortical structure you have an additional resistance, and on the labial surface of the tooth the cortical tissue runs down so close to the root that there is very little other tissue between the root and the outer layer. On one side it is extremely thin and on the other side it is extremely thick, so you will find it much more difficult to move the tooth any distance in this direction than in the other through the same amount of space. I mention this to show that that is not a fair illustration, and that this cortical layer offers a

very great resistance. If it were not for this varying resistance here we could, by means of a machine of that kind, tell exactly how much the tooth ought to move by the application of a certain amount of power, but when you have the denser layer at certain points it changes the circumstances entirely. Dr. Case unquestionably gets his results in that way, and gets an immense advantage by having that arm running up there. I simply want to make the point that the tissues surrounding the tooth are not always taken into consideration in this matter, and that it is much more difficult under certain circumstances to produce the same movements than under others. That is a very important point.

So it seems to me that with this part of the problem and the matter of the post in the clay left out of the question, and confining ourselves entirely to the principle of the lever, which is not illustrated here, because of the two springs instead of one, the thing narrows itself down to the point of the simple application of force at certain points to the crown or the root; and when you attempt to move a tooth bodily inward by means of this appliance, you have a greater resistance, as I said before, than you have outward, because of the curvature of the palate, the cortical layer, and the immense amount of dense tissue that is there. It can be done, but it is more difficult in one case than in the other.

For the moving of the crown and root of the tooth at the same time the appliance of Dr. Case is valuable, especially when we wish to draw backward the roots of the teeth, as in cases where there is an unusual fullness under the upper lip and you wish to retract or draw back the roots of the anterior teeth. By running that bar out and applying the power in this direction, you are able to do it; but if you undertake to do it the other way,—if you wish to move the root outward instead of inward,—then I see no use for the appliance, because by the simple application of the power at this point, producing a natural fulcrum, the root will naturally tip out.

DR. CASE: Mr. President, and gentlemen of the National Dental Association, I begin to think that I amount to something. My friend, Dr. Guilford, sticks to me pretty closely, and I am very glad of it. Where I have made errors in terminology, I am only too glad to have a man of Dr. Guilford's ability correct me. I have no doubt that his points in regard to certain terms that

I used are, in some particulars, well taken. I never have attempted in these efforts to bring out anything more than general ideas, that would appeal to the common sense and practicability of different methods. I have never tried to prove them especially by mathematical calculations, and I do not pretend to be a professor of physics. I try to be a professor of common sense as much as I can, and I endeavor to teach in that way, and let my results speak for themselves as to the results of the common sense practicability of applying these common sense and scientific principles to the regulating of teeth.

Dr. Guilford started out by referring to something that I did not speak of in my paper to-day, about a pail hung upon a pole and carried by two men. He says this is not a lever. It certainly is not the *ordinary* lever because, as I stated in my paper, a lever is a rigid arm resting upon a fixed point, having power and weight applied at some two other points. But I placed it in the hands of two men with a view of showing to a student or any one else the relative weight which each man carried when the pail was placed at different points along the pole. Now, if Dr. Guilford desires that we make this an exact lever, let one end rest upon a stone if you please. Just exactly the same amount of energy is expended at that point resting upon a stone or a fixed fulcrum as would be if in the hands of a man. But it brings it a little nearer to the thought of a student if somebody is supporting the weight. That was my only object. Practically it is a lever just the same, and it strikes me as a hair-splitting attempt to make anything else out of it.

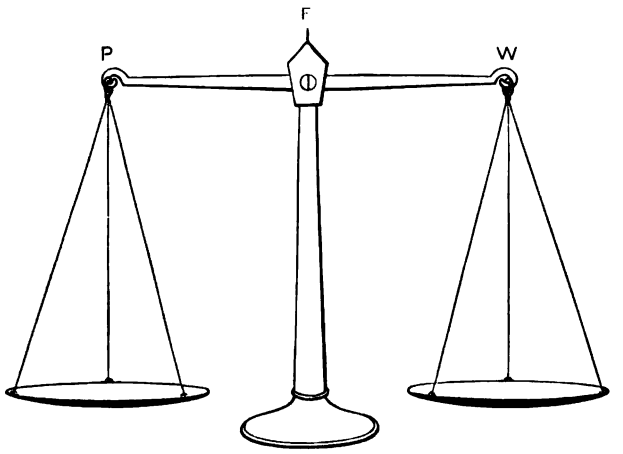
He further claims that I have no right to speak of levers as combining the qualities of the first and second kinds. I must call them either one or the other.

It happens that a tooth lever combines these qualities, and one of the principal objects of my paper was to show the importance of knowing how to regulate the relative force exerted at points of fulcrum and weight, because both of these points acted as a fulcrum to the other.

As an example of a lever of the first kind I used the beam of an ordinary balance scale. (See Fig. 1.) And now, to illustrate a lever which combines qualities of the first and second kinds, let us suppose that the upright standard of our scale is a tube in which is

placed a spiral spring upon which rests the beam, and provided with an indicator that will tell us the exact amount of force exerted at the point of the original fulcrum. If we remove the weight pan and give this end of the arm of the lever a stationary attachment, we now have a perfect example of a lever of the second kind,—points of weight and fulcrum having been transposed. If we now put a five-pound weight into the power pan, the indicator will show that the force exerted at W is ten pounds, and that would be the same if the point were stationary and the whole a lever of the first kind.

FIG. 1.



If we replace the pan, we now have an example of a lever which *combines* the qualities of the first and second kinds,—the points F and W acting as fulcrums to each other in proportion to their resistance. That is exactly what we have when we apply power to the crown of a tooth for the purpose of moving the root. Cervical and apical areas of resistance may be considered practically as points or areas of fulcrum and weight.

Dr. Guilford criticises my use of the word "area" and says I must not use it, but I am going to continue to use it, because we never can get a point that is so small that it is not an area. Everything has an area so far as that is concerned, and where these resisting surfaces become greater than "points" it is proper to call them areas.

I did not quite understand Dr. Guilford's objection to the clay

illustration. I introduced it more particularly to give an idea of the probable amount of movement that took place at the lower end of the post in proportion to the movement at the surface. So far as this box of clay is concerned, you saw that I did not even look at it after Dr. Goslee finished moving the post as directed. If the result was liable to be variable, as Dr. Guilford claims it will be,—if it was going to be different from what I said it would be, why did I not look at it? Why, we have done that thing probably fifty times, Dr. Goslee and myself, and we have invariably obtained the same result. What is that result? It is just exactly the way I stated. I do not care what these measurements were. I cannot understand Dr. Guilford's attempt to distort this example. It looks to me, and I think it must to you, that the movement at the lower end is a little more than one-half of the movement at the surface. I think the pivotal point is a little above two-thirds the depth of the hole. It happens that that would be exactly the truth, if it was worked out mathematically according to physics. This morning in my paper I explained that we usually could not get a perfect result according to mathematical rules of physics unless we assumed a hypothetical medium. What I meant by that was that we know of no spring that has a uniform resistance to motion. I cannot think of any. If we take a steel spring, it requires a certain force to move it one inch. It requires a little more force to move it the second inch, and so on, because it is not uniform, and it is so with every elastic substance that I know of. All gaseous substances that I know of would move in that way, because the further they were pressed the more resistance they would offer. Now, that would not work at all in mathematical physics, because you would have to have a medium that is uniform throughout every portion of its motion. That is so with a great many laws of physics. Take, for example, the law relative to the "resultant" of forces, where two or more forces are projected upon a single point. The rule is that when two forces are projected upon a single point it will move in the direction of the diagonal of a parallelogram whose sides are proportional to the momentum and direction of the forces. But in order to have that true we must assume for all this action a hypothetical medium, something that does not exert the slightest resistance against these various motions. And so it is in regard to the movement of clay,

as I explained. If we desire to have the motion of this post in the clay represent along its surface the exact mathematical resistance it presents at every point, then we must assume something that is different from clay. Professor Stratton, of the Chicago University, to whom I submitted the proposition, at first thought it was exactly as I had stated in my paper, but after working it out mathematically with a post four feet in length, he said the pivotal point would come about two inches above two-thirds the depth of the hole. So much for that.

I think I have answered almost everything. I do not think it is particularly necessary in speaking of levers that we should have a fixed point, because we do not. We must call them something. Teeth are levers in the grasp of a regulating machine. In retruding incisor teeth, we have a considerable resistance along the cortical layer of the alveolar process. If power is applied above this area the tooth becomes a lever of the third kind, because power is applied between the principal points of resistance. Again, if the roots are long, like a cuspid's, for instance, that extend into the substance of the true bone, the apical ends would be the fixed points and the more stationary fulcrum. So we would have in the long teeth, we may say, a lever of the second kind. In the short teeth with the more stationary fulcrum surrounding the cervical portion, we have a lever of the first kind. But in the front teeth generally we have both; we have a movement at both places, as I showed you by the models this morning. We have a movement at both areas, one in one direction and one in another, and the relative force exerted can be largely regulated by the position at which we apply power. If a retruding power is applied at the incisal end of an incisor tooth, the force exerted on the apical end of the root in the opposite direction will be about one-half that at the cervix in the direction of the applied power. If we apply a power in the center of the crown it will be about three times as great at the cervical portion as at the apical; and if we apply it so that our power arm is one-fourth that of the weight arm or at the gingival border, we will have about five times as much force exerted at the cervical as at the apical end.

DR. GUILFORD: Dr. Case, in illustrating with the scales or balances, spoke of the ordinary scale being a lever of the second class, which is correct. He then took off one arm of the scale, and

putting the fulcrum above, said that was a different kind of a lever, and therefore that that instrument combined the qualities of two forms of lever, which is not the case. When the scale is on, the fulcrum is here [illustrating], and when he takes it off and the fulcrum is at this point, the appliance is changed from one form of lever to another by means of that change.

Then one other point. He said he could use a spring here and that it would still be a fulcrum; but he would not get the real registration of the weight until that spring was compressed sufficiently to indicate it.

DR. CASE: Of course not. I have not claimed that.

DR. GUILFORD: You said when the fulcrum was here and the weight here, that by applying five pounds here you would have a registration of ten pounds here.

DR. CASE: Yes.

DR. GUILFORD: If you can do that you will make your fortune. If you can make five pounds there weigh ten pounds here, you will be upsetting the laws of physics. If it is five here it will be five there, and you cannot make ten out of it. Then I should like to ask the doctor why the springs in that fixture are of uniform strength? If you had put in something to represent the resistance of the cortical layer, like a piece of wood or cork, would not your results have been different? That would have given us a more correct illustration of what you wanted, and it would have altered the result, because in that experiment you have taken no account of the cortical layer.

DR. CASE: I have never attempted to. I have repeatedly said in my paper that the force exerted merely represents the amount of force and not the amount of movement. It was not in proportion at all to the teeth, as I have claimed. I simply wanted to represent the amount of force exerted, and if I did not have those springs of uniform strength it would not be fair.

DR. GUILFORD: Suppose you applied force in this direction and you had that spring to overcome it; if you had a block of wood here to represent the cortical layer, the amount of force would be different entirely.

DR. CASE: There would be no difference in the amount of force. There would be a difference in the amount of movement obtained.

SECTION I.—Continued.

*The V. H. Jackson Compensating Dental Bridge.**

PAPER BY V. H. JACKSON, OF THE SECTION.

THE methods employed in general practice of anchoring and supporting a dental bridge of either class, the fixed or the removable, make them, as constructed up to this time, applicable only for a limited number of the cases presented.

Especially is this true where the crowns of the teeth that can be used as abutments are not broken away. The present method of attaching a bridge to the teeth with a collar, or a collar having a cap, requires that the size of the crown be lessened by grinding away the enamel and dentin, at least until it is of the diameter of the neck of the tooth; and if the teeth that are to be used as abutments are inclining laterally, from, or toward one another, the overhanging portions of the crowns have to be dressed away until their surfaces are parallel with one another, to permit the proper adjustment of the bridge.

The cutting away of enamel from teeth that have vitality, in cases where the result can be obtained in a manner less destructive, is, in the author's opinion, inexcusably bad practice. If the pulps of the teeth are dead it is not so objectionable. Grinding the enamel from the teeth is usually painful, and some patients will not permit the operation to be completed. It is also generally a trying work for the operator.

Where the natural teeth have been extracted it is essential that the spaces caused by their removal be closed with artificial ones, in a manner that will complete the masticating surface without causing inconvenience or annoyance to the patient, and at the same time have the teeth so adjusted as not to mar the appearance.

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The V. H. Jackson compensating dental bridge is intended to accomplish these ends and to overcome some of the many other difficulties encountered in bridge-work. It is a device for the attachment and permanent support of artificial teeth, filling spaces in either the upper or lower arch where some of the natural ones have been removed and others left in a position favorable for abutments. The method is applicable for almost any case presented. It avoids the necessity of cutting the enamel from the grinding and lateral surfaces for reducing the size of the crowns, and is especially adapted for filling spaces where the adjoining natural teeth are leaning toward one another in such a manner as to exclude general methods of attachment.

The molars in the distal part of the arch, where one or more of the teeth have been extracted, are usually found tipping forward (Fig. 1). When the molars incline forward in this manner, the

FIG. 1.

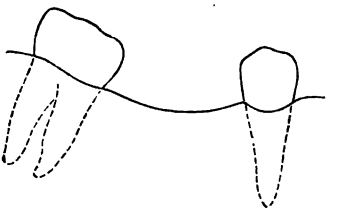


FIG. 2.

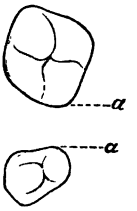
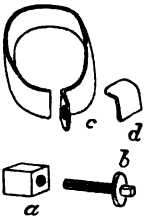


FIG. 3.



space caused by the extraction is greater between the necks of the teeth than at the top of their crowns. If these overhanging sides of the teeth are not dressed away it is necessary that the appliance or plate for filling the space (as made at present) be short enough to pass through the narrowest part, and when made in this manner objectionable openings are left between the ends of the appliance and the teeth, which permits the collection of food particles.

The compensating bridge to be described is so constructed that it can be suspended by the attachments to the teeth, leaving a space between it and the gum, or, as is usually preferred, it can be made to occupy all of the space; that is, fitting the teeth and resting in contact with the gum.

A great variety of attachments for supporting a bridge for this purpose have been experimented with by the writer. Only a few of those giving the best results will be mentioned now. In mak-

ing an appliance, a very accurate plaster model of the teeth that are to be used as abutments and the contour of the gum between them is the first essential. (The details of taking the impressions will be described later in this paper, and with a clinic if desired.)

The bridge is generally applied from either the lingual, buccal, or labial side of the arch, the side chosen being usually determined by the angle of the teeth and the more favorable contour of the gum, as seen from an examination of the mouth and the model. Sometimes the position and shape of the teeth favor the adjustment of the appliance from one side, and sometimes from the other, depending principally on the prominences (Fig. 2). As an example, it will be observed from the drawing that, owing to the mesial contour of the molar and distal surface of the bicuspid, as seen at *a*, *a*, the appliance should be inserted from the left side.

After it has been determined from which side the device is to be inserted, the appliance is made by first fitting to the plaster or metal model a collar cut from a pattern, to each of the teeth for anchorage, generally having it broad enough to reach from the gum to the grinding surface (Fig. 3), leaving one end about one-eighth of an inch longer than the circumference of the tooth and bent outward at a right angle, with a hole passing through the end, as seen at *c*, and strengthened with an additional layer of gold having the other portion of the collar well contoured to fit the surface. The collar is made of plate metal or crown gold, the thickness depending on the amount of strain.

It should be mentioned here that if the collar is to pass between teeth that are close together, not having a natural space between them, the ones to be used for abutments should always be wedged away from the adjoining ones sufficiently to allow the collar to pass very freely between them before the impression is taken.

Several methods of fastening the collar tightly around the tooth have been utilized. For most cases as yet the tap-bolt (*b*) and nut (*a*) give the best satisfaction, but they should be made of hard, non-corrosive metal, and be provided with a deep, coarse thread, generally having the thickness of the nut about one-half or more of the lateral diameter of the tooth, made round or square, and fitted to the collar by dressing away one side, so that after it is securely soldered to the end of the collar the bolt when inserted will pass near the side of the tooth. After these parts have been

attached, the collar should be applied to the natural tooth to see if it is properly adjusted.

A strong clip of plate metal (Fig. 3, *d*) should always be made to extend from the collar onto the grinding surface of the tooth, and be soldered to the collar at the same time the threaded nut is united. The purpose of the clip is to prevent the collar from slipping toward the gum, and it should be stiff enough to withstand any pressure that may be caused on the bridge in mastication.

Fig. 4. The tap-bolt should be sufficiently large to have the requisite amount of strength and be provided with a round head, having two small holes (as seen at *a*) or grooves made on either side (*b*), or have a slot across its surface like an ordinary screw (*c*) for turning, with an especially devised wrench; or the bolt can be made with a shoulder near the end, and having the head square (*d*). When either form of bolt is passed through the

FIG. 4.

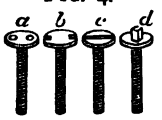
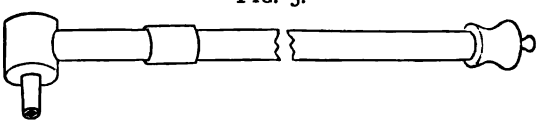


FIG. 5.



hole in the end of the collar and made to enter the nut, the shoulder or head will engage with the end of the collar and tighten it around the tooth as the screw is turned into the nut.

Fig. 5. The wrench for turning the bolts is made from a No. 3 S. S. White right angle hand-piece, with the shaft and tube of the hand-piece lengthened to be about six inches long, and having a small knob on the end of the shaft for turning. Into the head of the wrench can be fitted any form of chuck or driver required. The chuck can be made having points to fit into the holes or grooves in the round-headed bolt, have a flattened point, like a screw-driver, for the slot, or be made by cutting off the point of a watch-key and lessening its diameter to fit into the end of the wrench for turning the bolt with the square head. In some instances a bolt with roughened surface can be retained with oxyphosphate cement, and not depend alone on the screw thread.

In the construction of the bridge it is sometimes arranged to have the bolt enter from the lingual side, and sometimes from the buccal.

The collars should first be adjusted to the teeth on the model,

and if it is intended that the bridge be supported by the natural teeth only, and not rest in contact with the gum, porcelain saddle-backed teeth, or porcelain caps for covering the grinding surface, should be chosen and properly backed and waxed into place, making a good articulation. The parts should then be invested and metal flowed in, forming the body of the bridge the same as in making ordinary bridge-work.

If the bridge is to be made to rest in contact with the gum, the alveolar process should always be well settled. A saddle of thin platinum or platinum and gold is first swaged to fit the portion of the gum that is to be covered. In cases where the ridge of the gum is quite prominent, and it is decided to have the bridge cover both sides of the elevation and fit well the necks of the teeth, it is usually essential that the teeth be wedged more than would be necessary if it were made to cover a smaller part, as the projecting ends of the saddle require that the teeth be pressed slightly apart while adjusting. This can be accomplished by first wedging backward either the tooth that is in front or back of the space.

The collars and saddle are fitted to the model, porcelain teeth backed, articulated, and properly waxed into place, after which the parts should be invested and united with gold, vulcanite rubber, or cast metal. For experimental cases soft solder can be used.

A few typical cases, with bridges that have been made, will now be described.

Case 1. Miss H., aged twenty-eight. The first left inferior molar and the second bicuspid had been absent about thirteen years. Otherwise, with the exception of the third left molar, the lower arch was complete. The second left molar was tipping forward and inward, with only the distal part of the grinding surface articulating with its antagonist, the second superior molar. The first bicuspid was of good form, medium size, standing erect, although inclining slightly outward.

Fig. 6 illustrates the position of the teeth. In the superior arch the first right molar was missing.

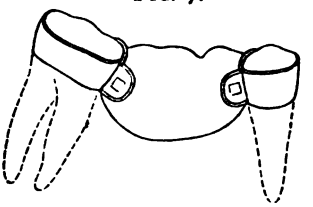
After a careful examination, it was determined from the shape of the teeth and the contour of the gum that the bridge should be inserted from the buccal side, and that the tap-bolts for holding the free ends of the collars be introduced from the lingual side. The bicuspid was separated freely with wedge from the cuspid,

after which a plaster model was made. A gold collar, No. 28 standard wire gauge, was fitted on the model to each of the teeth to be used for abutments, having a nut and clip attached as described, and also a *shield* (see Fig. 7); the latter was made of plate metal bent into a semicircle and soldered to the side of the nut near the inner edge, and made quite broad to project to the surface of the bridge, forming the ends. The purpose of the shield is to make room for the free end of the collar and the head of the tap-bolt, and to guide them to their place in adjusting.

A saddle of gold-faced platinum, 34 gauge, was then swaged to fit the contour of the gum and necks of the teeth, having it broad enough to cover the gum, so that when the bridge was finished the width would be about the same as the lateral diameter

FIG. 6.

FIG. 7.



of the teeth used for abutments. The surface of the metal was stippled and the edges turned up. After the collars and saddle were adjusted to the model two plain rubber teeth were articulated into place, being sustained with wax. The tubes were filled with plaster of Paris and the parts invested in a vulcanite flask, so that when the flask was separated the lingual side was exposed. The wax was removed and the case packed with rubber, vulcanized, and polished, following the method employed in making a partial rubber plate. The nut that was soldered to the collar had previously been shaped so that the rubber would clasp about it to make a strong union.

In this case, owing to the saddle covering a considerable portion of the gum, it was necessary to wedge the bicuspid backward a little more than the thickness of the collar that was used before

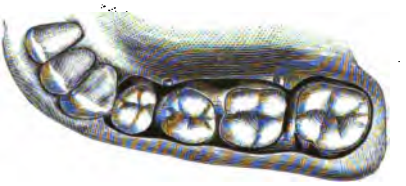
the impression was taken, so that in adjusting the bicuspid would yield a little, favoring the easy admission of the bridge.

Before setting the bridge the teeth for anchorage were polished, made dry, and the inner sides of the collars covered with a thick solution of chloro-percha and sprung backward to pass over the teeth as the bridge was being adjusted. The collars were then drawn around the teeth and the tap-bolts screwed quickly to place, having an assistant hold the wrench. After the bridge had been made firm the small openings around the head of the tap-bolts, which were square, were filled with gutta-percha.

Fig. 8 illustrates the bridge in position.

FIG. 8.

FIG. 9.



It was made and inserted January 1, 1898. I have examined it from time to time, and have found it in as good condition as when adjusted, there being no congestion or irritation of any of the tissues. The patient reports that it is easily kept clean, and is so firm that she uses it more in chewing than she does the teeth in the opposite side of the arch. This is probably due partially to the absence of the first right superior molar. Fig. 9 illustrates a similar bridge made with metal.

Case 2. Dr. S., aged fifty. The first and second right inferior molars had been extracted. The alveolar ridge was sharp and well defined. The other teeth of the arch were in position. (Fig. 10.) The second bicuspid stood erect, leaning slightly outward. It was badly worn on the grinding surface, and much broader at the top of the crown than at the neck. The third molar was tipping forward and inward at an angle of about forty degrees.

It was also considerably worn on the grinding surface. Owing to the worn condition of the teeth, their articulation with the upper ones was very close.

Before taking an impression for a plaster model on which to make the bridge, the second bicuspid was wedged backward from the first bicuspid about as much as twice the thickness of the collar to be used.

From examination it was found advisable to insert the bridge from the buccal side, having the tap-bolts enter from the lingual

FIG. 10.

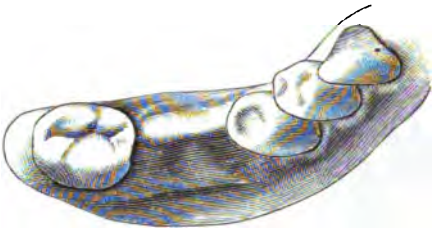
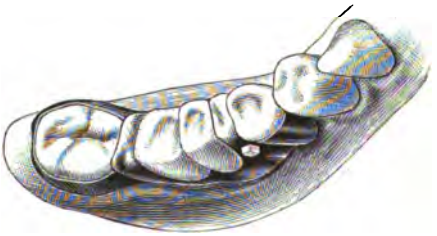


FIG. 11.



side. A saddle of gold-faced platinum was swaged to fit the part of the alveolar ridge that it was intended the bridge should rest upon. Gold collars were fitted to each of the teeth to be used for abutments, provided with a tap-bolt and nut, a shield, and a clip of gold to extend onto the grinding surface. Owing to the prominence of the gum back of the molar it was necessary to make the collar narrow at that part, and strengthen it with an additional layer of gold.

The space between the second bicuspid and the third molar had become so narrow by the tipping forward of the latter, that but one large artificial tooth could be inserted in the space. After the parts had been adjusted on the model, and the tooth articulated

and waxed to place, it was invested with plaster of Paris in a flask in position so that when the flask was separated the lingual side was presented. It was packed with white rubber, vulcanized, and finished the same as in making a partial rubber plate.

The appliance was inserted on July 5, 1898. (Fig. 11.) The articulation was found to be a little high, and on July 10 this was corrected by grinding away some of the porcelain. After this the patient did not call at the office as directed, and on July 22 I addressed him a letter of inquiry and received the following reply:

NEW YORK, July 22, 1898.

DR. V. H. JACKSON:

Dear Doctor,—Your note of inquiry received. The "bridge" is no longer a "bridge of sighs," for it gives me no more trouble. It is not even a "bridge of size," for it has failed almost to put itself in evidence. With many thanks, etc.

Case 3. Mrs. M., aged forty. Fig. 12. The first left superior molar, the first bicuspid, and the left superior lateral were absent. The spaces between the second molar and bicuspid, and the cuspid and bicuspid, had become narrowed by the movement of the teeth, and the space between the central incisor and the cuspid was a little broader than should be. The second bicuspid had become rotated backward in its socket, which would naturally interfere materially with the adjustment of a bridge. The teeth that remained were considerably worn. The patient was very desirous of having the spaces closed, but objected to wearing a plate; and did not want to have the teeth dressed away, as would be necessary for the insertion of a bridge such as is in general use.

An accurate impression was taken on February 1, 1898, and it was found from the examination of the model that the contour of the gum favored the admission of the bridge from the palatal side; but, owing to the shape of the spaces in this case, if the teeth were attached to the bridge before inserting they would need to be narrowed laterally to permit the bridge to enter from that side of the arch. This narrowing of the porcelains would mar their effect when inserted.

To overcome this difficulty the Mason detachable porcelain crowns were used. Saddles were fitted to the gum in the spaces, and caps were swaged of gold crown metal to cover the palatal and a portion of the mesial, distal, and grinding surfaces of the

cuspid and bicuspid. The cap on the latter covered only the lingual cusp. A threaded nut resting on the saddle parallel with the gum, and a piece of plate metal above it, fitted to fill the space back of the bicuspid and make a grinding surface, were soldered to the part of the cap that covered the distal side of that tooth. A narrow collar was then fitted to the buccal side of the bicuspid near the gum, and extended across to the mesial surface of the cap, to which it was soldered. About one-eighth of an inch of the other end of the collar was bent outward to nearly a right angle, and a hole made in it for the passage of a square-headed tap-bolt into the nut. To the lateral sides of the cap, fitted to the

FIG. 12.

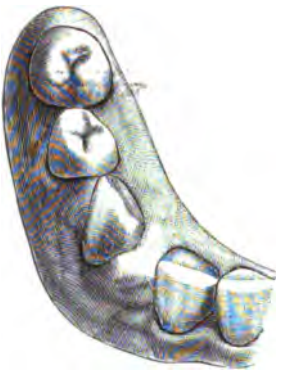
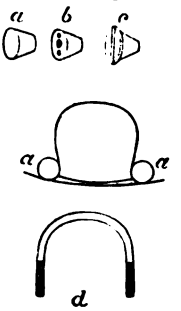


FIG. 13.



cuspid and saddles, were soldered funnel-shaped tubes (Fig. 13, *a*, *a*), in proper position for the entrance of conical nuts (*b* or *c*) from the palatal side. A U-shaped loop of gold wire with threaded ends (*d*) was shaped to cross the labial side of the cuspid at the margin of the gum and enter the tubes and be engaged with the conical nuts described. For adaptation and ease of adjustment, the curved portion of the collar had the temper drawn and the inner part flattened with a corundum stone. The ends of the wire were left long to project through the tubes a little, so that the nuts could be more easily adjusted. It is found from experience that a wire collar made in this manner for crossing the buccal side of the teeth is more easily adapted, is stronger, and does not mar the appearance as much as the narrow bars used in ordinary bridge-work. Having the tube and nut made in a conical form permits the wire to draw more closely to the approximal sides of the tooth,

and allows the nut to be made thicker, which strengthens the thread. If desired, the nut can be made having a slight flange on the larger end to prevent it from wedging into the tube when traction is caused on it, as seen at *c*. The face of the nut should have a groove across its surface (*c*), or a hole on either side (*b*), to engage with the wrench, similar to those shown in Fig. 4.

The grooved backings for the Mason crowns were then fitted to the saddles in the spaces between the central incisor and cuspid, and the cuspid and the second bicuspid, and each made narrow enough to allow the bridge to be easily withdrawn from the palatal side. The porcelain fronts were then fitted in place by grooving out slightly the plaster teeth of the model, not dressing any from the sides of the porcelain, leaving that part to be fitted after the

FIG. 14.

bridge was adjusted. All of the metal parts were then waxed carefully together on the model and removed, first slipping away the porcelain fronts. The piece was then invested in the usual manner, united with 18-carat gold solder, and finished the same as in ordinary bridge-work.

The teeth for anchorage were polished, and the parts of the bridge that were to rest in contact with them were covered with chloro-percha and the bridge adjusted. The threaded wire loop was passed into the tubes, and the conical nuts and tap-bolt were turned quickly to place. The ends of the looped wire and nuts were made smooth with the surface of the bridge. The lateral sides of the porcelain fronts were then ground to fit the natural teeth and attached with chloro-percha. Fig. 14 illustrates the bridge in position. I examined it just before my vacation, and found it in good condition and giving satisfaction.

Case 4. Owing to the shape of the cuspids, much difficulty has been experienced in the construction of a bridge for filling the

space between them, caused by the loss of the four incisors, where the cuspids are intact.

The cuspids should first be wedged freely from the bicuspids, and an accurate model made.

A cap is swaged in the usual manner to fit the distal, palatal, and mesial surface of each of the cuspids, and a saddle to fit the gum. To the mesial side of each of the caps and to the saddle is soldered a funnel-shaped tube, made as seen in Fig. 13, *a*, *a*, having the larger end of the tube toward the palatal side and projecting to the desired line of contour of the bridge, with the smaller end of the tubes pointing toward the labial side and resting as near the gum and tooth as practicable. A small wire collar about 19 gauge, with one end threaded (Fig. 13, *d*), is fitted to the labial side of the cuspid, having the inner part of the curved portion flattened with a corundum stone and the temper drawn to assist in shaping it to the surface of the tooth, and the end passed through the tube to engage with a cone-shaped nut, with or without a flange (Fig. 13, *b* and *c*), having the other end of the wire collar flattened and bent at a sharp right angle to form a hook to catch into a hole made in the distal side of the cap, or it can be provided with a tube and nut,—that is, having a funnel-shaped tube and nut on either side of the tooth. Gum or plain plate teeth are backed, ground to fit the saddle or to the gum proper, and waxed to place. The parts are carefully removed from the model, invested, and united with solder in the usual manner.

The caps on the cuspids should cover well the distal and mesial sides, which may make the adjustment of the bridge more difficult; but the teeth should be wedged until the bridge can be inserted and the wire collars adjusted and drawn tightly with the nuts. Chloropercha is used on the inner parts of the caps and collars in setting.

Case 5. Mrs. T., aged forty-five. An impression was taken January 26, 1898, and a bridge made to be adjusted from the palatal side (Fig. 15). Teeth had been extracted, leaving spaces between the second bicuspid and the second molar, and the cuspid and second bicuspid. Saddles were swaged to fit the gum in the spaces, and a cap made to cover the palatal, mesial, and distal sides and inner cusp of the bicuspid. Funnel-shaped tubes for the accommodation of a U-shaped wire, made to cross the buccal side of the tooth and engage with threaded nuts, were attached with

solder on either side of the cap in contact with the saddles, with the larger opening toward the palatal side, as seen in Fig. 13, *a*, *a*. A collar, provided with a nut, a tap-bolt having a square head, a clip, and a shield, was fitted to the second molar, having the head of the bolt toward the palatal side. Porcelain plate teeth were backed, fitted into the spaces, waxed, invested, soldered, and the bridge finished in the usual manner.

Case 6. Fig. 16 shows a bridge supporting two artificial teeth inserted on the left side of the lower arch. It was constructed similar to that seen in Fig. 15, excepting that the molar had a swaged cap passing over the grinding surface, with an adjustable collar fitting it and passing underneath on the distal and buccal sides, and was attached with solder to the collar on the lingual and

FIG. 15.

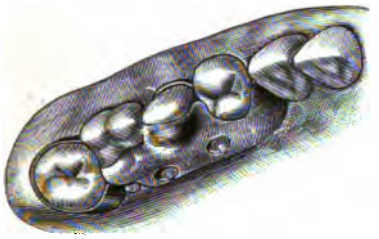


FIG. 16.

mesial sides. The cap attached to the adjustable collar in this manner gives the appearance and effect of a gold crown, and does not interfere materially with the adjustment of the bridge.

Case 7. Fig. 17. An impression was taken for Miss C. January 3, 1898, and a bridge made for supporting a first right superior molar, filling the space previously occupied by the molar and second bicuspid, the space being narrowed by the movement of the teeth. The buccal side of the bicuspid was rotated backward, leaving a narrow space between it and the cuspid. The natural molar was very small and short. The bridge was supported with a metal crown over the molar, and a cap swaged to fit the inner half of the bicuspid. A funnel-shaped tube was soldered to the cap on the distal side of the bicuspid, through which passed one end of a wire collar having a screw thread which engaged with a nut. The opposite end of the wire collar was made to fit the surface of the tooth, and was bent at a sharp right angle, forming a hook, to enter a hole on the mesial side of the cap. Having a hook in one end of

a U-shaped collar in this manner makes it less conspicuous than when two tubes and nuts are used.

It has been the object of this paper to describe a few of the many methods experimented with of constructing bridges for filling gaps in the dental arch.

The appearance of metal over the teeth is always objectionable, but occasionally there are conditions, such as the tipping of the

FIG. 17.

FIG. 18.

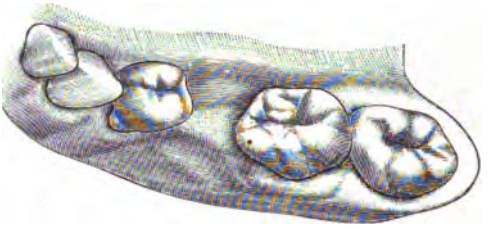


FIG. 19.

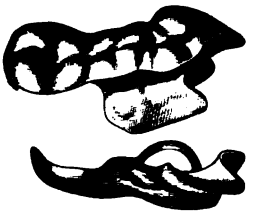
teeth, or a portion of the crown being absent and the rest moderately strong (Fig. 18), in which it is advisable to retain the remaining portion and cover it entirely with metal; and in some cases it may be desired to extend an entire metal bridge across the space.

Quite a serviceable bridge for this purpose in the distal part of the arch is made as seen in Fig. 19. The grinding surface of the teeth used for anchorage should be dressed sufficiently to allow

a metal cap to pass over them without interfering with the articulation. On an accurate model is placed a saddle that has been swaged to fit the gum between the teeth to be used as supports, the inner ends or points of the saddle being dressed as little as possible for the adjustment. An artificial tooth is then waxed into the space, and an impression taken of the buccal side of it and the teeth to be used as abutments. Another impression is taken of the lingual side and dies made, from which pieces of plate metal are struck into form to fit both the buccal and lingual sides, having the parts next to the gum resting in contact with the saddle described.

After these pieces of metal are well fitted to place the upper edges should be rounded, any depressions in the grinding surface filled in with wax, and another impression taken, from which a

FIG. 20.



metal cap is swaged. The artificial tooth and wax are then removed, after which the saddle, the cap, and the part covering the buccal side are joined with solder. To the plate covering the palatal side should be soldered a staple made to extend into the space. (Fig. 20.) In setting the bridge the parts resting in contact with the teeth should be covered with a thick solution of chloro-percha. The inner part of the cap should be filled in with pure gutta-percha or oxyphosphate of zinc, and the palatal plate warmed and pressed to place. Screws can be used in preference to the staple if desired.

It might be stated here, incidentally, that a moderate degree of success has been attained in supporting a bridge of two teeth in the lower arch with a second bicuspid for support. This form of bridge is applicable only in cases where the alveolar ridge is well defined, the tooth for anchorage very firm, and all other conditions favorable. A collar with a tap-bolt and nut is made in the usual manner, and a saddle of platinum swaged to fit the gum. Plain

teeth are articulated, waxed to place, and the case finished like an ordinary plate.

There is naturally a considerable leverage on the tooth used for anchorage with this form of bridge, and the collar around the tooth should be drawn very tight with the bolt, and the case examined frequently.

IMPRESSIONS.

For the system of bridge-work that has been described it is necessary that an accurate impression be had, otherwise a good result cannot be attained.

For this purpose I have devised impression trays, having one shaped for use in the front, and another for the distal part of the arch. They are made of rolled German silver, in two parts or lateral halves, for covering the inner and outer sides of the teeth and gum. Each part or side is bent nearly to a right angle to form a flange. These lateral halves are joined together by two bars, which are soldered to the flange on one side and made to pass through short cylinders that are soldered to the flange on the opposite side, and so arranged that as the two parts are pressed together in taking an impression the flanges slide by one another over the grinding surfaces of the teeth. For convenience in removing the tray, a small hook is soldered to the outer side of each half.

The impression is taken by placing a small amount of softened compound in each side of the impression tray, and the surface rubbed thoroughly with soapstone. The tray is then placed over the teeth, and the parts pressed gently together with the fingers or an especially devised plier. It is essential that the tray be held steadily in place until the modelling compound has become thoroughly hard. The parts of the impression are then separated and removed with a plier similar to that used for adjusting a rubber-dam clamp, by placing the points of the pliers into the hooks described.

DISCUSSION.

DR. HUNGERFORD: Notwithstanding the lateness of the hour and the fact that many members have sought refuge in the hall, I cannot refrain from saying something upon this paper. Any man who will attempt to fit a gold band to a plaster impression has not the faintest conception of adaptability. Any man who will

attempt to use soft-solder, vulcanite, or fusible metal in a case of bridge-work where strength and beauty are required has no taste or esthetics. Any man who will advocate screws and split bands as an adaptation for attachments for a bridge has no idea of physics. I should like to take the paper up in detail, but I understand there is a strong desire to come to the red tape portion of the Association's affairs, which seems to exercise a great many of the members, and seems to be the only excuse for their attendance, and I will not take more of your time.

DR. JACKSON: I should like to have the gentleman have his say, because I intend to have one afterward.

DR. HUNGERFORD: I said my say in my first two paragraphs.

DR. ESTERLY: In conversation with several friends, I find that there is a considerable reaction from the use of bridge-work. While I think that there ought to be a considerable reaction from bridge-work as it is practiced in the larger cities especially, yet I think the most beautiful and the most useful thing in the way of substitution for lost teeth is by the proper application of this means through the best known methods. In the application of bridge-work, I believe that the tendency to conserve the pulps of the teeth used for the abutments of bridges is a mistake. I believe that in the proper adjustment of a bridge for a permanent denture, or as nearly permanent as such operations can be, parallel walls for the abutments of the bridge are absolutely necessary, and I believe that can be accomplished in most cases, and that projections, bolts, screws, and things of that kind are unnecessary; and while high-class work of this kind may not have the strength of others, yet I have seen work of the kind which was quite as permanent as removable pieces possibly could be. I think it has been demonstrated that the use of chloro-percha for the retention of a denture of any kind is not as good as the use of cement. I should like to see a man with the skill and execution necessary to follow out such a course of proceeding as the one outlined by Dr. Jackson. It would take a man of the highest mechanical attainments. I doubt if the most skilled jeweler could accomplish it in as perfect a way as the work can be done by the other method. Some years ago the bands such as have been described here, bound with a clamp, were used by a neighboring practitioner, and I think you will find a description of it which is practically the same thing in

the *Dental Cosmos* of 1886. I have seen several ways of fastening these bridges on teeth, but I think that for the proper construction of bridge-work that is to be of service and stability what I have indicated is necessary. I do not think it is necessary to destroy pulps in all cases, but I think the tendency is in that direction.

DR. JACKSON: I should like to ask Dr. Hungerford if he is doing bridge-work.

DR. HUNGERFORD: Yes.

DR. JACKSON: What do you do with such cases as I present here?

DR. HUNGERFORD: I destroy the pulps and put on a solid bridge.

DR. JACKSON: Is it an excusable practice to destroy the pulp in all cases, for us to cut away the tooth, kill its pulp to straighten its wall? Is it not the worst kind of practice? How dare a man in these progressive times stand up before the National Dental Association and say that he kills pulps in teeth like these?

DR. HUNGERFORD: I did not desire to speak to the Association again, but inasmuch as that question is asked I will answer it in the affirmative, that it is excusable to kill the pulps of any teeth when necessary. I would tell the gentleman that he is unacquainted with the histology of tooth-structure, the formation and development of the teeth, if he says the pulp of a tooth is of any service, after the tooth has concluded its growth, except to warn the individual of approaching decay. It is inexcusable to leave the pulp in any tooth where decay, injury, or extraneous causes have destroyed its enamel shield and covering. I would say, Mr. President, that any method of adjusting a bridge otherwise than by the destruction of the pulps of the teeth and the adjusting of a band that is firmly and well adapted to the crown is not a scientific method of adjusting a bridge. And if I were an infidel and did not believe in the Bible to-day, I would believe in it as a prophecy when it is said the wise men came from the East, but did not give us any notice that the wise men ever went back.

DR. JACKSON: I have simply to say in regard to the gentleman's remarks that I hope he will live sufficiently long to become convinced that the pulp is placed in the tooth for a good purpose.

DR. HUNGERFORD: Tell us any excuse for it in the conditions I have named.

DR. JACKSON: I can give a great many reasons why the pulp should be preserved in most all cases.

DR. HUNGERFORD: Then why do you not do it? That is one of the most important matters.

DR. JACKSON: I am distinctly opposed, as the paper has stated, to the cutting away of the enamel and dentin for the purpose of attaching a bridge, often cutting down and destroying the pulps of two teeth for the purpose of adjusting a single artificial tooth.

DR. SITHERWOOD: I should like to ask if you undertake to say that you make a bridge the bands of which are fastened with screws of such character that in masticating or any use of that bridge the bands will not give? Do you fasten the bands so closely that there will be no give, that they will be permanent in place?

DR. JACKSON: Are you accustomed to bridge-work?

DR. SITHERWOOD: Yes.

DR. JACKSON: Do you ever attach a bridge with the collar around a tooth?

DR. SITHERWOOD: I do.

DR. JACKSON: I supposed that all men doing bridge-work did. Have I not as strong a collar as you have, when I have it adjusted and fastened?

DR. HUNGERFORD: It is impossible.

DR. SITHERWOOD: You do not quite get the import of my question, which is this: Do you fit a band to the body of the tooth itself and fasten it with screws so that there will be no give to the band, so that it would be permanent without any give?

DR. JACKSON: I neglected to answer that question directly. I do. I have been very successful with this method. I find that I can set a collar with a screw much closer than I could in the other manner. I can squeeze it around the tooth so closely without cement that it will not move. By the other method it always has to be loose to permit it to slip over the tooth. This is also a contoured band, and is several times as rigid as the straight band used with the ordinary method, and in which case the surface of the tooth has to be narrowed down to let the collar pass over it.

If there are any other questions you would like to ask, I shall be delighted to answer them. I do not feel like arguing the question concerning the enamel, because I think the profession have settled that matter.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. *Resolved*, That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. *Resolved*, That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. *Resolved*, That it is unprofessional to use on cards or signs anything except name, title, and address.

4. *Resolved*, That this Association now in session direct that Sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics, or to give other exhibitions before this body.

5. *Resolved*, That two general addresses be delivered annually, on the second and third days' meetings, on some general topics of interest to the whole profession, the subjects to be selected by the third division of the Executive Committee, the first division of the Executive Committee to nominate the essayists annually.

6. *Resolved*, That a Standing Committee of three be appointed, to be known as the Committee on Terminology, whose duty it shall be to prepare and submit a carefully prepared report at each annual meeting of this Association.

7. *Resolved*, That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

8. *Resolved*, That a committee of three be appointed by the chair to cooperate with the Army Medical Museum and Library managers in enriching its stores of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

9. *Resolved*, That the National Dental Association condemns the use of secret preparations known as "*local anesthetics*," as well as all other secret preparations.

10. *Resolved*, That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects

of the papers read before them and digests of the same, and to send reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the chairman of the Section to which they belong.

11. *Resolved*, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

12. *Resolved*, That lists of the ex-Presidents of the American Dental Association and of the Southern Dental Association shall be published annually in the Transactions of the National Dental Association, and that all members and officers hold the same relation to the National Dental Association that they did to the former associations.

13. *Resolved*, That the Secretaries of Sections are required to forward to the Chairman of the Executive Committee, sixty days before the annual meeting, the titles of papers to be submitted, with the names of the authors, in order that they may appear in the official program.

14. *Resolved*, That the Executive Committee shall prepare and mail to the members an official program, at least twenty days before the annual meeting. This program shall have a list of the hotels, the meeting place, and the railway or steamboat facilities for getting to the place of meeting from the principal points in the United States.

This notice shall be mailed to the journals at least one month before the annual meeting.

National Dental Association.

SOUTHERN BRANCH.

SESSION OF 1898.

Minutes of Transactions

OF THE

SOUTHERN BRANCH

OF THE

NATIONAL DENTAL ASSOCIATION,

SESSION OF 1898.

BY S. W. FOSTER, SECRETARY.

FIRST DAY—MORNING SESSION.

THE Southern Dental Association commenced its twenty-ninth annual session—being its first annual session as a branch of the National Dental Association—in the Bishop's Building, Cathedral Place, St. Augustine, Fla., at 11 A.M., February 22, 1898; the President, Dr. E. P. Beadles, in the chair.

Prayer was offered by the Rev. Dr. S. Hamilton Day.

Dr. J. N. Jones, of Jacksonville, welcomed the Association on behalf of the Florida State Dental Society, and presented the President with a beautiful gavel made of the wood of trees grown on Florida soil,—orange, hickory, palmetto, and oak. The gift was appreciatively acknowledged by the President.

The President then introduced the Hon. F. B. Genovar, Mayor of St. Augustine, who gracefully welcomed "the youngest-born of dental organizations to the oldest city in the United States."

Dr. S. Ewing Smith, President of the Florida Dental Association, followed with a witty address of welcome in behalf of the dentists of St. Augustine.

The President then read his annual address, which, on motion, was referred to a committee, subsequently appointed as follows: Drs. L. M. Cowardin, L. G. Noel, B. Holly Smith.

On motion, the report of the committee was made the special order of business for the night session.

A telegram of greeting was received from the Odontological Society of Chicago, to which the Secretary was instructed to respond with greetings in return.

Drs. S. B. Cook, J. A. Chapple, and H. H. Johnson were appointed to fill vacancies on the Executive Committee.

Dr. Chapple's application for membership not having yet been acted upon, Dr. E. G. Quattlebaum was appointed in place of Dr. Chapple.

On motion, the reading of the minutes was dispensed with.

After an intermission for the payment of dues, adjourned to 3 P.M.

The following members were either present or have paid their dues for 1898:

ADAIR, E. F.....Harmony Grove, Ga.
ALEXANDER, C. L.....8 S. Tryon st., Charlotte, N. C.
ALLEN, S. W.....P. O. Box 453, Tampa, Fla.
ALLEN, T. M.....P. O. Box 718, Birmingham, Ala.
BARTON, W. J.....209 N. Wall st., Paris, Texas.
BAUER, JOS.....New Orleans, La.
BEACH, H. E.....422 Franklin st., Clarksville, Tenn.
BEACH, JNO. R.....422 Franklin st., Clarksville, Tenn.
BEADLES, E. P.....324 Main st., Danville, Va.
BENTON, J. H.....65 Pollock st., Newberne, N. C.
BILLMEYER, U. D.....204 Richardson Bldg., Chattanooga, Tenn.
BLAND, CHAS. A.....Charlotte, N. C.
BLAND, M. A.....Charlotte, N. C.
BOOZER, J. E.....Columbia, S. C.
BRABSON, B. D.....522½ S. Gay st., Knoxville, Tenn.
BROCKETT, C. T.....301 The Grand, Atlanta, Ga.
CALVERT, J. T.....3 Main st., Spartansburg, S. C.
CASSIDY, J. S.....732 Madison ave., Covington, Ky.
CHAPPLE, J. A.....18 Grant Bldg., Atlanta, Ga.
CLEMENT, GEO. B.....Macon, Miss.
CLIFTON, W. R.....59 Provident Bldg., Waco, Texas.
COCKERILLE, S. J.....1338 New York ave., N. W., Washington, D. C.
COOK, S. B.....24 Loveman Block, Chattanooga, Tenn.
CORLEY, J. P.....Greensboro, Ala.
CORLEY, W. W.....Talladega, Ala.
COWARDIN, L. M.....407 E. Main st., Richmond, Va.
CRAWFORD, J. Y.....405 Jackson, Nashville, Tenn.
DALE, J. A.....217½ N. Summer st., Nashville, Tenn.

DAVID, J. W.....Mexia, Texas.
DICKSON, SOUTHALL.....Bolivar, Tenn.
DOTTERER, L. P.....102 Broad st., Charleston, S. C.
EATON, A. R.....Elizabeth, N. J.
EVANS, GEO.....133 N. 34th st., New York, N. Y.
EVERITT, D. E.....Raleigh, N. C.
EWALD, W. H.....Portsmouth, Va.
FIFE, J. G.....301 Trust Bldg., Dallas, Texas.
FOSTER, S. W.....62 Inman Bldg., Atlanta, Ga.
FRAZIER, J. E.....Birmingham, Ala.
FRINK, C. H.....Fernandina, Fla.
FROST, EDW. D.....86 W. Grand st., Elizabeth, N. J.
GRIFFIS, R. D.....209 N. Wall st., Paris, Texas.
GRINDALL, CHAS. S.....421 N. Charles st., Baltimore, Md.
HALL, J. A.....Collinsville, Ala.
HARDY, GEO. E.....Commonwealth Bank Bldg., Madison and Howard sts., Baltimore, Md.
HARRIS, J. H.....857 N. Eutaw st., Baltimore, Md.
HINMAN, T. P.....42½ Whitehall st., Atlanta, Ga.
HOLCOMBE, B. EUGENE.....Lumberton, N. C.
HOLLAND, FRANK.....24 Whitehall st., Atlanta, Ga.
HUNTER, E. L.....Fayetteville, N. C.
HUNTER, T. M.....Fayetteville, N. C.
JEWETT, H. R.....503 Grand Bldg., Atlanta, Ga.
JOHNSON, H. H.....306 2d st., Macon, Ga.
JOHNSTON, A. P.....Anderson, S. C.
JONES, HENRY C.....915½ E. Main st., Richmond, Va.
JONES, R. H.....Winston, N. C.
KEERANS, E. P.....Charlotte, N. C.
KELLS, C. EDMUND, JR.....Medical Bldg., New Orleans, La.
KETTIG, EDW. M.....319 W. Walnut st., Louisville, Ky.
KING, A. B.....Baltimore, Md.
KIRK, E. C.....12th and Chestnut sts., Philadelphia, Pa.
KNAPP, J. ROLLO.....620 Canal st., New Orleans, La.
LESUEUR, W. N.....404 Congress ave., Austin, Texas.
LUCKIE, R. K.....Holly Springs, Miss.
MARSHALL, JOHN S.....Chicago, Ill.
MARSHALL, M. C.....307 Union Trust Bldg., St. Louis, Mo.
MARTIN, W. T.....Yazoo City, Miss.
MCANALLY, F. H.....Jasper, Ala.
MCKELLOPS, H. J.....3548 Linden ave., St. Louis, Mo. (Permanent without dues.)
MELENDY, A. R.....Deaderick Bldg., Knoxville, Tenn.
MOORE, J. HALL.....104 N. 9th st., Richmond, Va.
MOORE, T. T.....Columbia, S. C.
MORGAN, H. W.....211 N. High st., Nashville, Tenn.

NOEL, L. G.....527½ Church st., Nashville, Tenn.
OELAND, JOHN C.....Spartansburg, S. C.
PARR, H. A.....38 W. 34th st., New York, N. Y.
PEARSON, A. A.....Montgomery, Ala.
PRESSEY, B. J.....Newport News, Va.
QUATTLEBAUM, B. J.....Winnsboro, N. C.
QUATTLEBAUM, E. G.....108½ Main st., Columbia, S. C.
QUATTLEBAUM, J. M.....108½ Main st., Columbia, S. C.
RENALDS, W. R.....Salem, Va.
RICHARDS, W. H.....93½ W. Church st., Knoxville, Tenn.
RUSH, R. A.....12 St. Joseph st., Mobile, Ala.
RUTLEDGE, B.....Florence, S. C.
SARRAZIN, J. J.....Morris Bldg., 4th floor, New Orleans, La.
SEALS, R. D.....Fort Smith, Ark.
SILL, CHAS.....301 W. 12th st., New York, N. Y.
SIMPSON, I.....Rockhill, S. C.
SMITH, B. HOLLY.....1007 Madison ave., Baltimore, Md.
SMITH, C. H.....203-4 Miller Bldg., Chattanooga, Tenn.
SMITH, L. A.....Port Gibson, Miss.
SMITH, J. W.....712 N. Eutaw st., Baltimore, Md.
STAPLES, GEO. S.....16 Murphy Bldg., Sherman, Texas.
TEAGUE, B. H.....Aiken, S. C.
THACKSTON, W. W. H.....Farmville, Va. (Permanent without dues.)
TURNER, V. E.....107½ Fayetteville st., Raleigh, N. C.
WALKER, R. H.....Norfolk, Va.
WALKER, WM. ERNEST.....Northrop Bldg., Pass Christian, Miss.
WEST, T. C.....508 Main st., Natchez, Miss.
WESTERFIELD, T. L.....232 Main st., Dallas, Texas.
WHITBY, T. P.....Selma, Ala.
WHITE, GORDON.....610½ Church st., Nashville, Tenn.
WILSON, F. C.....12 E. Jones st., Savannah, Ga.
WOLF, J. L.....1313 New York ave., Washington, D. C.
WOOD, F. L.....Roanoke, Va.
WRIGHT, G. F. S.....Georgetown, S. C.
WYATT, T. M.....Bentonville, Ark.
YOUNG, R. C.....Anniston, Ala.
YOUNGER, W. J.....Suite 306, Auditorium, Chicago, Ill.

All surviving charter members of the Southern Dental Association are "permanent members, without dues," as follows:

ARRINGTON, B. F.....Goldsboro, N. C.
ARRINGTON, W. T.....338 Main st., Memphis, Tenn.
AUGSPATH, LOUIS.....500½ Main st., Little Rock, Ark.

BOYD, H. D.....Troy, Ala.
BROWN, J. P. H.....919 Broad st., Augusta, Ga.
BURR, W. H.....Madison, Ga.
CARPENTER, L. D.....47½ Whitehall st., Atlanta, Ga.
CLARK, F. Y.....Saratoga, N. Y.
COLE, W. T.....Newnan, Ga.
COOKE, W. H.....Denton, Texas.
FRIEDRICHS, G. J.....641 St. Charles st., New Orleans, La.
GORGAS, F. J. S.....845 N. Eutaw st., Baltimore, Md.
HOLLAND, S. G.....24½ Whitehall st., Atlanta, Ga.
KNAPP, JAS. S.....721 Washington ave., New Orleans, La.
LOWRANCE, H. A.....Athens, Ga.
MARSHALL, E. B.....Rome, Ga.
MCDONALD, R. A.....Griffin, Ga.
MORGAN, W. H.....211 N. High st., Nashville, Tenn.
RAMBO, SAMUEL.....Montgomery, Ala.
TIGNER, J. A.....Rome, Ga.

The following honorary members of the Southern Dental Association sustain the same relation to the Southern Branch of the National Dental Association, and are entitled to the Transactions:

HAPE, SAMUEL.....Atlanta, Ga.
TIFFANY, L. MCLAIN.....Baltimore, Md.
SUMMERS, PROF. T. O.....Nashville, Tenn.
SELBY, J. W.....Atlanta, Ga.
WALKER, MRS. J. M. ("Mrs. M. W. J.").....Bay St. Louis, Miss.
PREWITT, MISS EMMA.....Franklin, Tenn.
CROUSE, J. N.....Chicago, Ill.
WEDGEWOOD, J. C.....London, Eng.
MCLEOD, W. B.....Edinburgh, Scotland.

Honorary member Southern Branch National Dental Association:

WOODBURY, FRANK.....Halifax, N. S.

Any inaccuracies in the above list, in name or address, should be reported to the Treasurer of the Southern Branch, at once, in order that the necessary corrections may be made.

B. D. BRABSON, *Treasurer.*

522½ GAY ST., KNOXVILLE, TENN.

FIRST DAY—AFTERNOON SESSION.

The Association was called to order at 3 P.M., the President in the chair.

The following communication from Dr. R. Ottolengui was read, and, on motion, referred to the Executive Committee:

115 MADISON AVE.,
NEW YORK, Jan. 19, 1898.

MR. PRESIDENT AND MEMBERS OF THE SOUTHERN SECTION OF THE NATIONAL ASSOCIATION:

GENTLEMEN,—In behalf of the dentists of the United States, I beg to call attention to the movement outlined in the accompanying petitions, which are forwarded with the hope that they will receive the signatures of the members present.

This movement was inaugurated by the New York State Society, and has received the official indorsement of a number of other State societies who have appointed committees. I have furthermore received the promise of similar support from such State societies as have not met since the inauguration of the scheme.

The petitions which have been circulated are receiving signatures, and the signers are sending me very strong letters, indorsing the movement. I have at the present time fifteen hundred signatures, only two of which I need mention at the present time; these are Dr. Thos. Fillebrown, President of the National Association, and Dr. E. P. Beadles, President Southern Section.

I would like to have this matter discussed at your meeting in the hope that you will take some action which will aid the movement, but it is impossible for me to be with you, and I wish in advance to reply to an argument which almost certainly would otherwise be brought out in opposition to the scheme.

Those who do not understand our purpose, write me letters, saying that a restriction of the patent laws would be a detriment in depriving men of the only incentive which leads them in the direction of inventions. The answer to this is that a close study of the language of the petition will show that we do not by any means aim for a restriction on patents of legitimate inventions, but we wish to make it impossible for any one to procure patents of that class which, though granted in the past, have invariably been declared invalid when tested in a court of law. What a man may legitimately invent, have manufactured and sell, let him patent, say all of us; but it should not be legal for a man merely to conceive an idea and then protect it for his own selfish purposes, and exact a fee or royalty for the mere utilization of his idea, giving to the purchaser no tangible product thereof. When a dentist is compelled, with his own fingers, with his own skill, and with his own brain, to apply a method of operation in the mouth, it is not just that he should be compelled to pay

some man a royalty merely because he happened to think of it first. In the present day of progress no practical idea in dentistry will long remain undiscovered, and there is no justice in giving a big reward in the form of a tax on the dentists at large to the man who first chances upon a new thought; but if his thought results in something which can be manufactured and sold, so that the dentists may buy it throughout the land at one common price, then let that man have his patent.

Very respectfully,

R. OTTOLENGUI,
Committee N. Y. State Society.

The proposed amendment is embodied in the appended appeal to Congress, which was read by the Secretary:

To the Honorable Senators and Representatives in the Congress of the United States:

The undersigned, acting in concert with fellow-members of his profession throughout the United States, respectfully urges the passage of an amendment to the patent laws, which will in substance attain the object set forth in the amendment herewith appended as a suggestion.

Present law.

> SEC. 4886. Any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned, may upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor.

Amendment suggested:

"But no patent shall be granted upon any process or method of treating human disease, nor upon any process or method of restoring or replacing any lost part of the human body, except upon artificial substitutes, whole or in sections, which may be manufactured, sold, and delivered without the exaction of any fee, license, or royalty, beyond the common selling price of the manufactured articles."

The Committee on Revision of the Constitution of the Southern Dental Association (adapting it to the government of the Southern Branch of the National) not being ready to report, on motion it was resolved to continue to act under the old Constitution until the new Constitution is adopted, following as precedent the rule that "all officers hold their positions till their successors in office are elected."

The applications of Drs. J. A. Chapple, Atlanta, Ga.; A. A. Pearson, Montgomery, Ala., and W. W. Corley, Talladega, Ala., having been duly acted upon by the Executive Committee, the Secretary was authorized to cast the vote of the Association, electing them to active membership.

The Executive Committee reported the following resolution indorsing the movement inaugurated by Dr. Ottolengui:

Resolved, That the Southern Dental Association, as a branch of the National, indorses and approves the efforts of Dr. Ottolengui to have the patent laws so amended as to correct the evils now existing pertaining to dentistry.

H. H. JOHNSON,
E. G. QUATTLEBAUM.

The resolutions were adopted, and the Corresponding Secretary was instructed to notify Dr. Ottolengui of the action of the Association.

The Committee on Revision of the Constitution being now ready to report, Dr. L. G. Noel, chairman of the Committee, read the revised Constitution, which was discussed by sections, as the revisions were read, by Drs. Cowardin, B. Holly Smith, Chas. Sill, J. A. Chapple, E. G. Quattlebaum, E. P. Beadles, A. A. Pearson, J. N. Jones, J. P. Corley, and L. G. Noel.

The Constitution, as revised, was adopted by unanimous vote.

Members who had paid $3.00 dues, according to the old Constitution, were instructed to pay $2.00 more, the dues under the Constitution as adopted being $5.00 annually, three-fifths of which go to the Treasury of the National Association.

On motion, adjourned to 8 P.M.

FIRST DAY—EVENING SESSION.

The Association was called to order at 8 P.M., the President in the chair.

The Committee on the President's Address not being ready to report, Operative Dentistry was called.

Dr. B. D. Brabson, Chairman, reported a paper by Dr. L. F. Frink, entitled "Failures in Operative Dentistry," referred to the Committee by the Florida State Dental Association. The paper being accepted, was read by Dr. Brabson.

Discussed by Drs. E. G. Quattlebaum, Wm. E. Walker, L. M. Cowardin, S. B. Cook, Chas. Sill, S. W. Foster, H. H. Johnson, Frank Holland, L. G. Noel, J. N. Jones, and B. Holly Smith, and referred to the Publication Committee.

Operative Dentistry passed *pro tem.*

The First Vice-President, Dr. Wm. E. Walker, took the chair and called for the report on the President's address.

Dr. L. M. Cowardin, Chairman of the Committee, read the report.

Dr. Cook moved that the report be received and the Committee discharged. So ordered.

Dr. B. Holly Smith moved that the suggestions of the Committee be taken up in order and discussed. Carried.

The Secretary read the first suggestion with regard to name. That point having been settled in the discussion of the adoption of the revised Constitution, the second suggestion was read.

Dr. Beadles offered the following resolution, which was negatived:

Resolved, That we, the members of the Southern Branch of the National Association, hereby request the National Dental Association to allow the Branches to retain three-fifths of all dues.

On motion of Dr. B. Holly Smith, the Secretary read the portion of the President's address relative to examining boards and college faculties.

Discussed by Drs. Cowardin, C. A. Bland, Beadles, J. N. Jones, H. R. Jewett, S. B. Cook, B. Holly Smith, H. H. Johnson, E. G. Quattlebaum.

The Second Vice-President, Dr. T. P. Hinman, took the chair, and the discussion was continued by Drs. W. E. Walker, A. A. Pearson, H. H. Johnson, B. Holly Smith, J. N. Jones, Cowardin, Alexander, Beadles, and S. B. Cook.

On motion, adjourned to 9 A.M. Wednesday.

SECOND DAY—MORNING SESSION.

The Association was called to order at 9.30 A.M., the Vice-President, Dr. Walker, in the chair.

The discussion of the report on the President's address was continued.

The Secretary read the section with reference to the examination of the teeth of applicants for life insurance, and, on motion, the Corresponding Secretary was instructed to correspond with the leading life insurance companies on the subject, and to report the results at the next annual meeting.

The report of the Committee was referred to the Publication Committee, and the subject was passed.

On motion of Dr. Beadles, the Secretary was instructed to keep, so far as possible, a complete list of all the dentists in the United States, and was authorized to draw on the Treasurer for the amount necessary to purchase the successive volumes of Polk's Dental Register, as issued.

(The President now took the chair.)

Prosthetic Dentistry was called, and passed *pro tem.*

Dental Education and Literature was called.

Dr. H. R. Jewett, Chairman, read a brief report, and offered five papers, as follows:

I. The Educational Features of the Dental Association. By J. P. Corley.

II. Dental Education, from the College Standpoint. By J. A. Chapple.

III. Dental Literature: A Heretical View. By D. R. Stubblefield.

IV. Dental Literature: A Review. By D. E. Wiber.

V. The Prostitution and Abasement of Dental Practice. By W. W. H. Thackston.

Dr. J. P. Corley read his paper.

Discussed by Drs. Foster, H. H. Johnson, and B. Holly Smith.

Dr. J. A. Chapple read his paper.

Discussed by Drs. H. H. Johnson, B. Holly Smith, A. A. Pearson, W. E. Walker, Frank Woodbury (Halifax, N. S.), J. Y. Crawford, Frank Holland, and closed by Dr. Chapple.

The papers by Drs. Stubblefield, Wiber, and Thackston were then read in order by the Secretary, and, on motion of Dr. H. H. Johnson, in view of the fact that the ground covered by them had been largely reviewed by the previous discussion, were passed without further discussion.

Subject passed.

Dental Hygiene called.

Dr. Wm. E. Walker, Chairman, read his report, and offered two papers:

I. Dental Hygiene. By J. W. David.
II. Oral Hygiene. By S. W. Foster.

The report of the Chairman was discussed by Drs. Sill, Pearson, Cowardin, Crawford, Chapple, Quattlebaum, and Fort, and referred to the Publication Committee.

Subject passed *pro tem.*

Dr. A. A. Pearson read a brief poem on "The Dentist," contributed by his daughter, Miss Lulu Pearson.

On motion, an address with exhibit, on Bacteriology and Oral Hygiene, by Dr. A. K. Fort, was made the special order of business at the next session.

On motion, adjourned to 3 P.M.

SECOND DAY—AFTERNOON SESSION.

The Association was called to order at 3 P.M., the President in the Chair.

Dr. A. K. Fort was introduced and addressed the Association on the subject announced, and exhibited a collection of culture-tubes, illustrating his paper.

The subject was discussed by Drs. Cowardin, B. Holly Smith, G. F. S. Wright, Walker, Quattlebaum, Geo. W. Weld, Pearson, Noel, Crawford, Beadles, and closed by Dr. Fort.

The papers of Drs. David and Foster, on Hygiene, were then read and passed without discussion, the subject having been covered in the preceding discussion.

Dr. J. A. Chapple offered the following resolution:

WHEREAS, The propriety and urgent necessity for the government appointment of dental surgeons to the United States Army and Navy has long been recognized by the dental profession;

AND WHEREAS, This question has been debated so long that, in the opinion of this Association, time for decisive action has arrived: Be it therefore

Resolved, By the Southern Branch of the National Dental Association, that a committee of five be appointed, with instructions to proceed to Washington not later than the first of April next, and urge before the proper authorities the appointment by the government of dental surgeons to the army and navy. Be it further

Resolved, That President Fillebrown, of the National Association, be requested to appoint a similar committee from the other branches of the National Association who will co-operate and act in concert with the committee from this Association.

The resolution was adopted, and, on motion of Dr. Chapple, the Secretary was instructed to notify the President of the National Association—Dr. Thomas Fillebrown—of the action taken by the Southern Branch, and request the co-operation of the National body in the movement.

The subject was discussed by Drs. Walker, Hinman, Crawford, Cowardin, Chapple, and Beadles.

The following Committee was nominated and duly elected by the Association, to bring the matter before the Congress: Drs. J. A. Chapple, B. Holly Smith, M. F. Finley, J. Y. Crawford, and H. B. Noble.

Dr. Crawford declared his inability to serve on the Committee, and nominated the President, Dr. E. P. Beadles, in his place. Dr. Beadles was duly elected.

On motion, an address on the X ray, with exhibit of same, by

Dr. T. P. Hinman, was made the first order of business for the night session.

On motion, adjourned to 8 P.M.

SECOND DAY—EVENING SESSION.

The Association was called to order at 8 P.M., the President in the chair.

Dr. T. P. Hinman gave a brief history of the discovery and application to modern surgery of the X ray, illustrating his lecture by photographs, and demonstrations with the latest approved apparatus.

A brief paper on the subject of Dr. Weld's method, by Dr. J. V. Haller, was read by the Secretary, and the subject of root-canal filling was discussed by Drs. Corley, Cowardin, Holland, Crawford, Noel, Cook, Walker, and closed by Dr. Weld.

Prosthetic Dentistry was recalled.

Dr. C. L. Alexander, Chairman, read his paper, entitled "Some Hints on Crown- and Bridge-Work."

After a brief discussion by Drs. E. F. Adair, Noel, B. H. Smith, Holland, and Walker, the other papers on prosthetic dentistry were made the first order of business after the clinics on Thursday.

Prosthetic Dentistry was passed *pro tem.*

Dr. Wm. Ernest Walker read a communication on the subject of "The Chapin A. Harris Memorial."

Discussed by Drs. Beadles, B. H. Smith, Crawford, and Cowardin.

On motion of Dr. Crawford, Dr. Walker was appointed "a committee of one" to present the subject to the National Association at its meeting in August, the Association, through Dr. Crawford, pledging itself to be on hand and make the movement a success.

Dr. Hinman, on behalf of the Clinic Committee, gave notice of the clinics to be held the next day.

On motion, adjourned to 9 A.M.

THIRD DAY—MORNING SESSION.

The Association was called to order at 9 A.M., the President in the chair.

Clinics were given from 9 to 12 o'clock, when the Association was called to order and a reconsideration of the vote adopting the Constitution, as revised, was moved and adopted.

Drs. Noel, Walker, and Chapple were appointed a Committee on Further Amendments to the Constitution, necessary to bring it fully into harmony with the Constitution of the National Association.

At a later hour the final revisions were presented by the Committee and adopted, section by section, as read.

Discussed by Drs. Cowardin, B. Holly Smith, and Walker.

On motion of Dr. B. Holly Smith, the revised Constitution was then adopted as a whole.

On motion of Dr. J. Y. Crawford, a committee of three was appointed, with plenary power to revise the phraseology of the Constitution and have it printed and distributed before the next meeting of the Association.

The Chair appointed Drs. Noel, Walker, and Chapple as the Committee on Publication of the Constitution.

It was ruled that applicants for membership who have not been *elected delegates* by their State societies are not eligible to membership in this body, under the provisions of the Constitution adopted.

Chemistry was called; Dr. B. Rutledge, Chairman.

Two papers were offered by the Committee: I. By Dr. C. A. Bland. II. By Dr. B. Rutledge.

The papers were read by the Secretary, and the subject briefly discussed by Drs. B. Holly Smith, J. P. Corley, and J. A. Chapple.

The subject was passed.

The report of the Treasurer was read, showing a deficiency.

The report was approved, and the Treasurer was authorized to pay all the legitimate expenses of the meeting from the dues collected, and to make diligent effort to collect from absent members and make up the three-fifths due the National Association at its meeting in August.

Histology and Microscopy called.

The Chairman read the report, and offered two papers: I. By Dr. I. Simpson.* II. By Dr. Driscoll. The latter referred to the Committee by the Florida State Dental Association.

On motion, the papers were read by title and ordered published in the Transactions.

Subject passed.

The report of the Committee on Clinics was read, and ordered published in the Transactions.

Letters of regret of their inability to be present were announced from Drs. W. H. Richards and H. E. Beach, ex-Presidents of the Association.

Incidents of Office Practice were related and discussed by Drs. Walker, Cowardin, B. Holly Smith, Noel, Holland, Crawford, and Quattlebaum.

Subject passed *pro tem.*

On motion, adjourned to 3 P.M.

THIRD DAY—AFTERNOON SESSION.

The Association was called to order at 3 P.M., the President in the chair.

Incidents of Office Practice continued by Drs. Walker (Dr.

*Dr. Simpson having lost part of his paper, it cannot be published in these Transactions.

Hinman in the chair), Beadles, B. H. Smith, Hinman (Dr. Walker in the chair), and Crawford.

Subject passed.

Pathology and Therapeutics called.

Dr. H. H. Johnson, Chairman, read a paper entitled "Trigeminous Reflexes: Causes and Effects."

The paper was discussed by Drs. Crawford, Walker, Chapple, B. Holly Smith, Woodbury, Beadles, Hinman, and closed by Dr. Johnson.

The Committee offered a paper by Dr. J. H. Boozer, Atlanta, Georgia.

The paper was objected to, on the ground that the author was not in good standing in his State and city societies. On inquiry it was found that the author was not in good standing on the Treasurer's books; the paper was therefore rejected, and the name of the author, Dr. J. H. Boozer, was ordered dropped from the roll.

The report of the Committee on Appliances and Improvements was read by title and referred to the Publication Committee.

Dr. Wm. E. Walker demonstrated the use of the Bosworth and other very short-shank points in the electric plugger; also a wire device for holding the electrode steady, in the application of cataphoresis, differing from any on the market.

Subject passed.

On motion, adjourned to 8 P.M.

THIRD DAY—EVENING SESSION.

The Association was called to order by the President at 8.30 P.M.

Prosthetic Dentistry recalled.

Dr. Wm. E. Walker read a paper, entitled "A Hygienic and Esthetic Crown."

The paper was discussed by Drs. Cowardin, Crawford, Holland,

Alexander, Johnson, Pearson, B. Holly Smith, Walker, Quattlebaum, S. Ewing Smith, and I. Simpson.

Subject passed.

Report of Publication Committee read and approved.

On motion of Dr. Walker, approved by the Executive Committee, Dr. Frank Woodbury, Halifax, N. S., was elected an honorary member of the Southern Branch of the National Dental Association.

On motion of Dr. B. H. Smith, the Secretary was instructed to see that the Transactions are sent to Dr. Woodbury.

Dr. Woodbury expressed his appreciation of the honor conferred, and tendered an invitation to the members to attend the meeting of his own Association, in August.

Dr. H. H. Johnson read a paper on Cataphoresis.

A second paper on the same subject, by Dr. J. L. Mewborn, was, in the absence of the author, read by title, and ordered published in the Transactions.

Subject passed without discussion.

Dr. Walker exhibited Dr. Gysi's micro-photographs, speaking briefly of their value to the dentist.

The following telegraphic message from the Louisiana State Dental Society was received, tendering an invitation to the Southern Dental Association to hold their next annual meeting in New Orleans, in conjunction with the Louisiana Society, in February, 1899:

NEW ORLEANS, LA., Feb. 22.

DR. E. P. BEADLES, President, Ponce de Leon.

The Louisiana State Dental Society in session unanimously extends an invitation to the Southern Dental Association to hold its next meeting in this city during our carnival, February 14, 1899.

JOS. BAUER, D.D.S., *President.*

A letter from Mr. J. W. Selby was also read, indorsing the invitation.

On motion of Dr. Noel, the invitation was accepted and the Sec-

retary authorized to cast the unanimous vote of the Association in favor of New Orleans, La., as the next place of meeting.

The Secretary was instructed to inform the President of the Louisiana State Dental Society of the action which had been taken.

Drs. Crawford and Holland, respectively Chairman and Secretary of the Section on Operative Dentistry in the National Dental Association, earnestly requested the hearty co-operation of the members of the Southern Branch in the work of that Section.

ELECTION OF OFFICERS.

The hour for the election of officers having arrived, Dr. B. Holly Smith nominated Dr. Frank Holland, Atlanta, Ga.; Dr. L. M. Cowardin nominated Dr. Wm. Ernest Walker, Pass Christian, Miss.; Dr. J. Y. Crawford nominated Dr. S. B. Cook, Chattanooga, Tenn., for President.

Dr. Wm. Ernest Walker receiving a majority of the votes cast, was declared elected President.

On motion, the rules were suspended and the Secretary was authorized to cast the vote of the Association in favor of Dr. Thos. P. Hinman, Atlanta, Ga., as First Vice-President.

Dr. B. Holly Smith nominated Dr. E. F. Adair, Harmony Grove, Ga.; Dr. Quattlebaum nominated Dr. H. H. Johnson, Macon, Ga., for Second Vice-President.

Dr. H. H. Johnson receiving a majority of the votes cast, was declared elected.

On motion, the rules were suspended, and the Secretary was authorized to cast the unanimous vote of the Association in favor of Dr. E. F. Adair, Harmony Grove, Ga., as Third Vice-President.

Dr. B. D. Brabson, Treasurer; Dr. C. L. Alexander, Corresponding Secretary, and Dr. S. W. Foster, Recording Secretary, were unanimously re-elected to their several offices.

Drs. I. Simpson, Rockhill, S. C., and E. G. Quattlebaum, Columbia, S. C., were elected members of the Executive Committee in

place of Drs. W. T. Arrington and R. K. Luckie, whose term of office expires with the present meeting.

On motion of Dr. Cowardin, a vote of thanks was extended the Florida State Dental Society for courtesies received.

Drs. Wright and Crawford were appointed to escort the President-elect to the chair.

The officers were duly installed with the customary ceremonies, and the Association adjourned to meet in New Orleans, La., with the Louisiana State Dental Society, Wednesday, February 15, 1899.

S. W. FOSTER, *Recording Secretary So. Br. N. D. A.*

(By request of the Louisiana Society, the date was subsequently changed by the Executive Committee to February 9, 10, 11, and 13.)

Welcoming Address.

By J. N. JONES, D.D.S.

MR. PRESIDENT, LADIES AND GENTLEMEN, MEMBERS OF THE SOUTHERN DIVISION OF THE NATIONAL DENTAL ASSOCIATION, AND FELLOW-DENTISTS: Our State Dental Society, through its worthy President, has conferred on me the distinguished honor of extending to you a fraternal and cordial greeting, and in its name bid you welcome as our guests.

Welcome, then, my brothers and friends, not only to this beautiful city, your meeting place, but to fair Florida, the land of flowers and perpetual sunshine.

Welcome to this, the southernmost of the beautiful south-land of the grand old Union. We congratulate St. Augustine, the State of Florida, and especially our State Dental Society, in winning this, to us, the most important of all conventions.

We congratulate ourselves most heartily that you should elect to hold your initial meeting as a division of the National Association with us in Florida. Not, Mr. President, that we love you more as a National Branch, for, sir, we are in no sense unmindful of the twenty-nine years of exceeding great usefulness of the dear old Southern.

We sincerely believe, gentlemen, in throwing open our doors to you, that our State has never entertained an association of professional men who have accomplished more in the upbuilding of an indispensable science than could be credited to you and to the States composing your membership. Your influence has been felt in the legislative halls for good. The dental colleges throughout this land, of which we are justly proud, have not had the courage, if the inclination, to oppose your wishes.

I have presided over the Board of Examiners of Florida for

eleven years, and I desire to say here, gentlemen, that during this period improvements along all lines, directly and indirectly, are traceable to your efforts in this grand organized movement to bring order out of chaos.

Old and young men have frequently told me, at their examinations, that they had learned from your clinics how to perform intricate operations successfully, for which they expressed profound gratitude; so your light, my brothers, has by no means been hidden under a bushel.

Of the beauties of this, the oldest city of the United States, I will leave you to judge; others will give you an interesting sketch of its history and progress.

Of our State I would like to say more than can be said here with propriety.

Your pathway, my friends, to this city from the Georgia line does not do justice to Florida, therefore we would respectfully request that you suspend judgment until you have seen more of the country; which we trust you will find time to do before returning to your homes.

That ample facilities are offered for seeing this fair land of ours, let me tell you that Florida has within its borders 2713 miles of railroad, with an unbroken line of 1200 miles of sea coast, and the most magnificent hotels in the world, all of which are glad to render service to visitors, and especially to such a representative body of men and women as we here introduce to them.

I know you will pardon a little local pride on our part if we give expression to our anticipation, for we truly believe that Florida, from the commercial city of Pensacola and the Gulf of Mexico to the grand Atlantic Ocean, and from the beautiful hills of Tallahassee and the old Suwanee River to the placid waters of Biscayne Bay, will one day "blossom like the rose."

An old legend has it that the waters of Florida are under a charm, and when you drink thereof you must surely return to drink again. We truly hope, my friends, that you will drink freely of these charmed waters, and some day feel an irresistible desire to revisit the land of beautiful lakes and rivers.

Again I must ask your indulgence while I give you a few facts about the metropolis of the State. Jacksonville is in many respects an up-to-date city of about thirty-five thousand population; she has

seven miles of river front, eleven miles of electric railroad, eight miles of vitrified brick and seven miles of macadam pavement; a most excellent system of water-works, with electric lights throughout, of which a much larger city might feel justly proud.

She boasts of the finest suburban drives and bicycle roads to be found in the Southern country. The beautiful St. John's River, flowing by her door, affords unsurpassed boating and fishing, while her hotel accommodations are second to none in this country.

In conclusion, ladies and gentlemen, let me again assure you of a hearty welcome, and we wish for each and every one a most enjoyable sojourn with us. We do sincerely trust that none will regret their attendance on this grand meeting, but will in after-years turn back to its memory as a bright and happy page in life's history.

From the program, I know that an interesting and profitable time is in store for us all.

Now, Mr. President, I have another pleasant duty to perform. In the name of our Society I present to you, on behalf of your Association, this emblem of authority.

Sir, this gavel is but a slight token of our good will and esteem for you. Constructed as it is of Florida woods, by Florida hands, on Florida soil, it is truly a native Floridian; in other words, Mr. President, a genuine "Florida cracker," if you please. We trust, sir, when its *crack* shall resound through your meeting halls there may be none who will refuse to obey its call to duty, and that it may be wielded ever with wisdom and justice by your successors, as we know it will be by you at this meeting. On observing this little souvenir at future meetings think of us, and of this, your '98 meeting in sunny Florida.

BY DR. S. EWING SMITH.

IT affords me pleasure to say in the name of the citizens of St. Augustine, and of its dentists in particular, I bid you a cordial welcome; and when we say this it means a great deal; it means more than if it was said in any other city of the world, or by any other class of people.

Every nationality is represented, and we have in this city attractions in the way of houses and hotels, streets, sea-wall, forts,

beaches, and many other features unlike anything else to a true American.

Our Mayor has given you the key to the gates of our beautiful city, and, for fear the key may become lost by you, has ordered the removal of the "gates," and he bids you enter and partake of the hospitalities of this people.

The opportunities for bicycling, boating, fishing, hunting, horseback and carriage riding, and hotel accommodations are unsurpassed in America. We are up to date in every way; our wives, daughters, and sweethearts are the fairest among ten thousand; get acquainted, look around, and see our spacious palaces, our ivy-crowned houses, fragrant with legend.

We fancy you will be interested in viewing the ruins and ancient memories of wealth and curios of art in and around our city. Such as we have, the best is yours. We thank you for coming; we are honored by your presence; we shall be benefited by your service while here. And now let me say we are here for work as well as for sight-seeing and enjoyment, and we must be about our duties, knowing as we do that the eyes of the whole dental world are upon us. To aid our deliberations while here, we ask you to step in and help us in reaching conclusions that shall go out and benefit mankind.

In conclusion, I heartily commend and congratulate the committees of the grand old Southern and American Associations in the work which they accomplished at Old Point Comfort, Va., last August, in reorganizing a national head, realizing all that was grand and noble in them before the consolidation. This will do away with sectionalism, both having an equal interest in the success of the National; and we may look for a deeper interest, coupled with energy and perseverance. Science knows no East, no West, no North, and no South.

Annual Address.

By E. P. BEADLES, President.

GENTLEMEN OF THE SOUTHERN DENTAL ASSOCIATION, BRANCH OF THE NATIONAL DENTAL ASSOCIATION OF AMERICA: I appreciate the honor you bestowed upon me last August. I have endeavored to do my duty as I understood it: I beg that your criticisms be tempered with mercy, giving me credit for honesty of purpose and a sincere desire for the welfare of this organization as a factor in helping forward the interests of dentistry. In presiding over the deliberations of this body it shall be my earnest endeavor to be fair and just to all, at the same time enforcing the rules laid down for our guidance; as you must realize that unless this is done that measure of success and dignity which we all desire cannot be gained.

This meeting has been looked forward to with great interest and some anxiety on the part of many members here present. We recognize it as an experiment in some measure. All the members of the old Southern Dental Association had it in their hearts to do that thing which would be best, that thing which would do most to further the interests of our profession, when the question of "consolidation" was before us. It was difficult to decide upon what would be best. The two committees, one from the Southern and one from the American, did their work conscientiously. They recognized the difficulties, and labored to formulate a plan that would overcome them. Instead of consolidating the Southern and the American, the work done was really the formation by the members of these two Associations of a new organization, known as the National Dental Association of America. In the plan adopted provisions were made for branch organizations, one in the East, one in the South, and one in the West. Without this pro-

vision it is doubtful if anything could have been accomplished at Old Point, as a majority of the members of the Southern did not desire their Association to go out of existence. It was expressly understood that we should continue as the Southern Branch. The American might have continued as the Eastern Branch, but its members preferred to abandon it.

The reasons for continuing this Association are good. Such an organization is needed, not only for scientific advancement, but from a social standpoint. The true Southerner is a social animal; he is created that way. It is our desire to know each other personally. It is pleasant to renew our friendships annually. We get quite as much from each other in a social way as we do from the discussions. It is a mistake to suppose that if there are few papers, small discussion, and little in the way of clinics, a meeting of Southern dentists is a failure. Some of the most helpful hints are given in private talk. The grasp of the hand, the welcome in the eye,—we know and appreciate these things. Cold science is not all of professional life, nor should it be.

It is useless for me to review the past of the old Southern Association, though it might be appropriate, now that we are standing on the threshold of the new Southern. Its history is embalmed in the hearts of its members. Many tender memories come to us of those meetings in the past, nor could we bring ourselves to give them up. The time seemed ripe for a change. Thoughtful men believed a change would advance the interests of dentistry. The members of the Southern would not stand in the way of progress; thus we agreed, almost without a dissenting voice, to the plan adopted at Old Point Comfort.

Our present position may not be clear in the minds of all. First, this is an Association composed of dentists from the Southern States; second, it is a part of, and should work in perfect harmony with, the National Dental Association of America. This working together of the two Associations is an experiment. I know of nothing similar to it that has ever been tried before, but this should not frighten us. An experiment is an attractive thing, and it is the means by which man has climbed to his present exalted position in every department of endeavor.

It would not do to abandon this branch, as few men from the South would attend the National; on the other hand, most of us

who attend these meetings cannot afford to meet with the National every year. The solution seems to me to be this: The years when the National is meeting in other sections let us meet here in the South, as we have in the years that have passed; let us have an organization all our own,—not from any selfish motive, not that we will not welcome a brother from any section, but an organization in which we can work, in our own way, unembarrassed. The time for us to come strictly in touch with the National will be when that Association comes to our section. Then we become one harmonious whole. By this plan I see harmony and good feeling. I can see advancement. As in union there is strength, so here we shall have scientific achievement by a correlation of forces.

Some few have thought that, as a sign of "good faith," we should abandon our old name. Is there any good reason for this? If we are not in earnest in this matter, a change of name will not make us sincere. I am in favor of the old name, with the attachment "Branch of the National." This was my understanding as a member of the joint committee; this was my understanding of the resolution passed just before adjournment at Old Point. If there are sufficient reasons for changing, let us change; otherwise let us have the old name. It sounds well; it expresses just what we are; there is a sentiment about it which is pleasant; it cannot be improved upon. Let us keep it.

It seems strange to certain people that the men of the South cannot give up what some are pleased to call "sectionalism," a much misunderstood thing. We are "sectional" in that we love our section best; that is all,—nothing to be frightened about. A man can be a true Floridian and love St. Augustine better than any other town in the State. It is his privilege to love his own city best. He should praise it and be as sentimental over it as he pleases,—no man has a right to hinder him. So it should be with the different sections of our country. Nobody criticises the Westerner because he believes in and boasts of the West; but there are those who cry "sectionalism" as soon as a Southerner opens his mouth. Not that we love other sections less, but we love our own more. There is nothing offensive in this, and I know that I speak for the members of the old Southern Association when I say that we are willing and glad to clasp hands with our brethren from all sections in love and charity. We are more than willing to join

with them in any and all efforts to promote the welfare of our beloved profession.

OUR RELATION TO THE NATIONAL.

Article XIV, Section 1, of the Constitution of the National Dental Association reads, "For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled 'Branches.'" Section 2 of the same article reads, "Branches shall have such powers and privileges, and be subject to such obligations, as shall be determined upon from time to time by the National Association in annual meeting." As all the members of the branch are members of the National, they have a voice and vote on all laws which may be proposed touching the branch.

EXPENSES.

Each branch pays its own expenses, and then pays into the treasury of the National a certain amount, receiving therefor the privilege of membership for each of its members. By the present law three-fifths of the dues of the branch go into the treasury of the National. It is the opinion of the writer that this is more than we can afford, and he recommends that this Association send up a resolution requesting the National to change this, and suggesting a figure which seems to you to be just.

TIME OF MEETING.

It will be necessary, of course, for you to decide upon the best time of the year for this Association to meet. For several reasons, this month is one of the best. In all of the Gulf States this season is most pleasant. It will be well also for us to meet at a time when we will not conflict with the National, as some will desire to attend both. Dentists are probably less busy during the month of February than any other, and a few days out of your office at this season will do you good, and at the same time be attended with but little loss.

NON-MEMBERS.

This has been, and is yet, a most difficult question, How can we get the non-member interested in association work? It is a fact that nearly all of the members of our societies are progressive dentists, but it does not follow that all who are not members are

inferior men. It is certain that they are not as progressive as they should be, but many of them would be with us if they could be brought to see the importance of this work. Our officers, from year to year, urge the members to attend, but no attention is paid to the man who remains at home. This year I have sent notices to nearly a thousand men, none of whom are members of this Association. I sincerely hope there are some results. I had difficulty in procuring lists. Such lists should be accessible, and the officers of each succeeding year should send notices to every reputable dentist in all the South, urging upon them the importance of association work. Their absence is unjust to themselves and unjust to us. Whatever benefits we may procure for the profession the outsider gets, and with no effort from himself. A man should never be willing to get something for nothing. I would suggest that you consider this question, and devise some plan by which the non-member can be approached by circular, at least once a year.

ORGANIZATION.

There is no question about the fact that the dental profession in America is better organized than any other; with our schools, our Faculties' Association, with our National Board of Dental Examiners, with the National Dental Association, and this, the Southern Branch, with the State Associations and State Examining Boards, and with the Dental Protective Association, we have great reason to be proud. We have, in addition, a mass of literature. I made a special effort this year to get a report from the Committee on Dental Literature. I am not sure that such a report has been made in years. This Association has the right to pronounce upon this subject, to approve or disapprove of whatever may be sent forth as literature. I hope to hear a full discussion of the papers read. It would be within the province of the Committee on Dental Literature to report each year upon the various periodicals, and say whether they are "upright and correct." Will a truly professional journal advertise nostrums? Will such a journal advertise wood-cuts of sets of teeth? Will such a journal print the advertisement of a professional "ad" writer? It would take up too much of your time to enlarge on this point, but I think our associations should put themselves on record upon all these matters and utter no uncertain sound.

IMPORTANCE OF WORK.

I feel not the slightest apprehension for the success of this Association if the officers elected from year to year will work. See to it that you put untiring, enthusiastic men in official position. Not only must the President work, but every officer must do likewise. We have had the odds against us this year, but I doubt if ever a President of this Association had official assistants who were more willing to work than those elected at our last meeting; and whatever success we may have attained has been gotten by unremitting labor. Simply work, and I predict a great future for the Southern Dental Association, Branch of the National.

EXAMINING BOARDS.

I believe it to be within the province of the members of this Association to express themselves in regard to Examining Boards. Evidently the object of these boards is greatly misunderstood by many. We are continually reading the question, "Are not the college professors better fitted to examine men as to their qualifications to practice than the members of the boards?" This question need not be answered, rather the one, "Would all the colleges do their duty were the Examining Boards not in existence?" The sole object of the State boards is to place a check upon the schools, not allowing them to run riot in turning out incompetent men. Competency is all that we ask; insure this and the boards will go out of business.

Why should the faculties object? The Government puts a tax of eight cents per pound upon all manufactured tobacco. The large makers are not only willing to pay this, but would be glad to have it increased. Why? Because it keeps out the small manufacturer; thus competition is lessened. Why cannot our great schools be as wise as these tradesmen? Some of them are, and from them we hear nothing about Examining Boards.

Certain "professors" seem to feel insulted that men not teachers should examine *their* students. Would they be willing to have them examined by the teachers of a rival school? From experience, I think I am prepared to say that no school doing honest work, and only graduating competent men, need ever be afraid of the boards. Such schools may state with pride, "Our graduates can pass any board." I urge you to express your views upon this question, and believe that the boards should be sustained.

THE NATIONAL BOARD.

The National Board of Dental Examiners has been the subject of much criticism. For the good of the profession, this board and the Faculties' Association should be in harmony. The one has as much right to existence as the other, though this fact seems to have escaped some. The examiners might improve upon their present methods. The National Board should consist of the presidents of the State boards, and its work should be done by correspondence. They should, after inquiry, prepare a list of the schools which meet with their approval, and black-list those that are inferior. Thus they need not put themselves up for a target. Let us have peace. All who are honest are working for one great object. There are schools which have the best interests of dentistry at heart, and are willing to do all in their power for the betterment of dental education, though doubtless there are many which are "in the business" for the expected shekels alone, or a little so-called "honor." I am an earnest advocate of education, but believe the work can be done better by a few schools than by too many; and no thinking man will question the fact that we now have at least twice as many as there is any need for.

ARMY AND NAVY.

It has been suggested that this Association request the President of the National to appoint a committee to proceed to Washington and urge the appointment of dental surgeons in the army and navy. This is a most important matter. All will recognize the good that would result from the accomplishment of this. I would suggest, however, that you appoint a special committee from this Association, and, in addition, request the President of the National to appoint a like committee from that Association. The two acting together will have more weight.

INSURANCE EXAMINATIONS.

The above suggests the idea of insurance companies requiring an examination by a dental surgeon before the issuance of life policies. This idea was suggested some time ago by a well-known Southern editor. It seems strange that this has not already been done. It can only be accounted for in one way; that is, the peculiar disregard that most physicians have of the importance of the organs of mastication, the very foundation of health. To

accomplish this would mean a great deal. Many persons would have the value of the teeth thus brought to their attention, and in the end both the public and the insurance companies would be benefited. If statistics could be procured showing the condition of the teeth of all persons upon whose death any given company paid insurance in a year, I fancy the officers would open their eyes in amazement. This is an interesting as well as a pertinent question. Cannot this Association institute a plan by which such statistics may be procured? I am inclined to believe that an intelligent study of the teeth might reveal facts in regard to longevity that would be surprising.

PATENTS.

I have communications from a committee appointed by the Dental Society of the State of New York in regard to petitioning Congress to pass a law refusing patents on any process for healing diseases. The Secretary will present these letters in due time for your consideration. It seems to me to be a step in the right direction.

NATIONAL LIBRARY.

I commend to you the interests of the National Library. The new building recently erected in Washington should be the pride of every citizen, and every dentist should do what he can to make the dental literature placed there a credit to the profession.

OUR CONSTITUTION AND BY-LAWS.

Our constitution must be revised at this meeting; a committee for this purpose was appointed in August. From my experience during the year I should urge that a new arrangement of standing committees be made. Some important subjects are not provided for, and there are some perhaps that might be left out.

I consider the above questions all pertinent. In your wisdom you will discuss them as seems best. Doubtless there are many others of equal importance which will claim your attention. It seems to me the duty of the President of an association of this kind to point out in his annual address, after mature deliberation, such things as seem to him to be important, thus outlining the work to be done. I have endeavored to do this, though the effort may be feeble.

I believe in this Association. I believe in the men who com-

pose its membership. I know something of the ability here represented, but we cannot succeed as we desire without individual effort; this is all that is necessary, that every man do his part. We so often come to see and hear what "they" will do. Who are "they"? You are one of them, and if there is failure you are partly responsible. Our future is bright. I have had many encouraging letters from men who are not able to be present this year, and the spirit they breathe makes me feel that our future success is assured. Let us make a record to be proud of. Why not? We are able to do it. We have the great National to work with us. Its interests are our interests, our success is its success. We are one, and yet two. Let us maké this division the wonder and admiration of our brethren of all sections. Let them feel, as they have felt before, that we are *men.*

Charles Kingsley says, "The secret of thrift is knowledge. The more you know the more you can save yourself and that which belongs to you, and can do more work with less effort. Knowledge of domestic economy saves income; knowledge of sanitary laws saves health and life; knowledge of the laws of the intellect saves wear and tear of brain, and knowledge of the laws of the spirit—what does it not save?"

I once stood before that wonderful statue of Moses, by Michael Angelo, in the city of Rome. My guide pointed to a small crack in the knee,—the statue is in a sitting posture,—and told the story of how the artist, having completed this marvelous piece of sculpture, stood entranced before the work of his own creation. It was so life-like the workman smote the marble statue on the knee exclaiming, "Speak!" The small crack made by the blow from the hammer remains to tell the tale.

This is perfection in the art of sculpture. We may imagine the years of toil such perfection required. It was done little by little,—practice, experience, knowledge. This, gentlemen, should be our aim,—perfection. To reach this there must be thorough knowledge. If you carry from here one thought, one idea that will help you the better to minister to the needs of suffering humanity, your coming will not have been in vain. No sacrifice is too great to be made for the sake of knowledge, and when we have learned it our duty is to impart it to and use it for the benefit of our fellow-beings. I repeat, "The secret of thrift is knowledge."

Report of Special Committee on President's Address.

YOUR Committee would respectfully report that we consider the President's address a very able paper, and at this particular time in the history of this Association of more than usual importance. While embodying many valuable suggestions, we would propose that the limited time will only enable us to recommend especially the following points for discussion:

First, in regard to name. In sentiment your Committee agrees with the President. We recommend, however, that, in accordance with our understanding and action at Old Point, the name of this Association shall be "The Southern Branch of the National Dental Association," as provided in Article XIV of the Constitution.

Second. Referring to the point raised by the President, that two-fifths of our dues may prove insufficient for our maintenance, your Committee believes he has overlooked the following benefits we are to receive from the three-fifths paid to the Treasurer of the National,—namely, that the National will publish our Proceedings for us, and that we each get a copy, together with the transactions of all the other branches; that the National will also undertake to defray the expenses of any scientific investigations we may recommend; that each member of this branch will receive copies of any publication that may emanate from the National. Therefore, we advise that we try the plan set forth in the Constitution, at least for one year. We commend the zeal displayed by the President in his efforts to build up the membership of this branch, and recommend his example to succeeding officers.

That portion referring to Examining Boards your Committee would like to have read and discussed, when we shall each perhaps have something to say; being all three college men, we feel a delicacy in recommending action upon this point. We suggest that a

resolution be adopted instructing the Corresponding Secretary of this branch to correspond with the prominent life insurance agents, setting forth the importance of the examination of candidates for life insurance by oral pathologists.

Patents. The section relating to patents has already been acted upon by the Association.

Constitution and By-laws already acted upon.

In conclusion, we recommend that the address be published as a part of the regular proceedings of the Association.

Respectfully submitted,

L. M. COWARDIN, *Chairman;*
B. HOLLY SMITH,
L. G. NOEL.

DISCUSSION.

DR. COWARDIN: I hope this report will be fully discussed, but I would prefer that some one not connected with the schools would open the question.

DR. C. A. BLAND, Charlotte, N. C.: It must be admitted that the colleges did not put forth their best energies until they were pushed forward by the Examining Boards. I do not believe that the antagonism spoken of really exists. I should like to hear the subject discussed.

DR. E. P. BEADLES: Not being "a college man," I am free to say what I please. In the first place, I am in favor of the colleges. Some one said the antagonism spoken of does not exist. I am very glad to know it, but somehow or other we are being made to believe that it does exist. Who is responsible for that belief? If it does not exist, the guilty parties ought to be sat down on. Who is it? Is it the editors? If so, let them speak out; let us see who it is. If there is nothing in it, let us shut down upon it. Editors must have something to print, but if that is all there is in it I am glad to know it. I was sorry to believe that such hard feelings existed, and shall be glad if there are no grounds for the belief. However, something must be done to keep incompetent men out of the profession, and that was how the idea originated that some restrictions upon the schools were necessary.

DR. J. N. JONES: I was in hopes that some other member of State Examining Boards would have something to say upon this

very important subject. The colleges which are doing honest work have nothing to fear from the Examining Boards. What are the boards for? They can have but one object,—raising the standard of dentistry. I have been interested in reading the proceedings of the National Board of Examiners. Certainly no college need fear their requirements. Our State Board is not a member of the National Board; we have been content to go along slowly in our own way, but I have felt that the National Board was accomplishing a grand work. If it succeeds in placing a check upon the reckless manner in which some colleges have turned out so-called "dentists" it will have accomplished much. It is true, some colleges have refused to comply with the demands of the National Board,—colleges, too, that certainly had no reason to fear the requirements,—but I, for one, propose to heartily indorse the action of the National Board. We should not be too hasty in jumping at conclusions. Are they not working in the cause of progress? Are they not all men who have the cause of dental advancement truly at heart? Do they not make daily sacrifices for the upbuilding of our grand profession? College men are like all other men, in that they are not perfect; some may even have a thought for the silver dollar,—they are but human. But all should be willing to comply with the recommendations of the National Board. I hope the day is at hand when there will be no way open to enter the dental profession save through the dental college. The dental law of Florida is due to the efforts of our State Society. Florida was formerly the great dumping-ground, but that is changed now. I hope the time is coming when a college diploma will be made the universal prerequisite to license.

DR. H. R. JEWETT: There is a paper to be read bearing directly upon this subject. I move that further discussion upon this point be deferred until we hear the paper.

DR. COWARDIN: The motion is out of order. We are not hearing papers, but discussing the President's address.

THE CHAIR: The point of order is sustained.

DR. JEWETT: My only object in the motion was to save time, and not go over the same ground twice.

DR. S. B. COOK: We meet with one great source of trouble in Tennessee, and I gather from Dr. Jones's remarks that it is the same in Florida; and that is the application of second-course

students for license to practice between terms. I understand that Florida makes a diploma a prerequisite to examination. I would ask by what authority you can do that?

DR. JONES: By a provision of the dental law.

DR. COOK: We had to examine thirteen or fourteen student applicants.

DR. JEWETT: I made the remark alluded to by the President; that there is no conflict between the colleges and the boards. Some one is responsible for statements to that effect. There is no conflict between the National Board of Dental Examiners and the National Association of Dental Faculties. The former was inclined to exceed its authority, but that has all been happily settled. The State boards have a duty to perform. They act as a check on the colleges to the extent that if an incompetent graduate comes before them they turn him down; this must be a check upon any disposition to turn out students recklessly. But what college would knowingly so risk all that has been spent in building it up? It would be certain death to that college; competition is too sharp, too close, to take such chances. They know their students must attain a high grade to have a standing before the State board. You ask what is the use of State boards? Why, the State boards have done more to enforce the laws, to build up the colleges than any other one thing. Colleges that teach only how to put in an amalgam or a cement filling and make a rubber plate have no show before the State boards, and students soon find out where the men come from who pass the boards. The boards are the greatest possible aid to the colleges in carrying out their highest ambitions.

DR. BEADLES: Then who is responsible for all we hear and read on this question?

DR. COWARDIN: The trouble lies in this: We as college men are on one side of the fence; the boards are on the other side. Let each do his own share of the work and there will be no antagonism. I was surprised to hear our President say that this body ought to uphold the National Board of Examiners in blacklisting the colleges.

DR. BEADLES: I said that the State boards should uphold the colleges that meet their approval, and blacklist those that prove themselves inferior. I did not ask the Association to uphold the National Board.

DR. COWARDIN: I take our President's statements in his address as his recommendation of what, in his opinion, ought to be done by this body. The National Board, through its representatives from the State boards, undertakes to say to the colleges, in a dictatorial manner, do thus and so or we will blacklist you and publish you to the world as disreputable; and that is the trouble. I have the greatest respect in the world for the State boards, but let them attend to their own business, not to ours. Their mission is as high as that of the colleges, but I look upon the colleges as private institutions of learning. The office of the boards is to protect the public; they are not the guardians of the college. If we do not send to the boards men who can stand this examination, their function is to bar them from practice. The colleges do not undertake to say to the boards, you must do thus and so. I say let the college attend to its own business, and let the boards attend to theirs; then there will be no trouble. In my State the amendment to the law that the Florida Society has obtained—the diploma as prerequisite to examination—has just been repealed by our Legislature. When a law is made too strict for the public, then a man goes to the Legislature and asks for a relief bill. The session before this thirteen dentists got the ears of a man who controls a hundred votes, and they got a relief bill through through sympathetic appeals. There was danger of having the whole law repealed regulating the practice not only of dentistry, but of medicine, pharmacy, and veterinary surgery. The efficacy of the whole law was endangered.

DR. B. HOLLY SMITH: There can be no progress without friction. Such discussions as the present are not fruitless nor profitless, but we want to be consistent and not unfriendly. The examining boards are created by law. They were not created to oppress the dentist, but to protect the people. But I place myself in the position of the student; they are our human brothers. I cannot make my heart like stone and say, "You must absolutely reach this mark." If a young man is frightened, his timidity may cause him to fail; you might fail in the same position. It is not in my heart; I have not the judicial mind; my temper is to put up with human frailty. Our duty is to help our fellow-men; not to keep them out, but to prepare them to enter in. For this I labor in my school morning, noon, and night; my one purpose is to send

out young men having the stamp of energy, imbued with knowledge.

It is the most painful thing in my life to feel, "I cannot vote for this man;" it is a struggle for me; the hardest task to decide, "You shall not graduate;" to reflect, unless he gets my vote he must fail. I would be glad if I never had to pass sentence. I love to teach, but it is a heavy burden to examine. I would not openly proclaim the flame and sword, but the usefulness of the examining boards has been greatly overrated. If they came to my door to examine my student I would labor earnestly to enable him to pass. I would even study *theology* if the board said they had to have it. But we don't know what the requirements of all the State boards are, and it is impracticable to meet *all* requirements. The men who graduate from our college are fit to practice dentistry, though they may fail to pass the Examining Board. A young man, from sheer timidity, may fail to pass an examination, yet if you handle him continuously, give him an opportunity to tell you in his own way what he knows, you may find him absolutely competent, yet through constitutional timidity he may utterly fail to pass the board. One such young man said he was treated as if he was an intruder, an impostor, trying to get in where he had no business.

I have antagonized examining boards openly, but I have withdrawn my opposition and strive now for one thing,—the unification of dental laws. I am a murderer, according to the verdict of a physician who attended the death-bed of a certain young man. He said he was murdered by his examinations,—the terrible strain of passing the college examination, followed by that of the State Board, utterly prostrated him.

The people are behind the law-makers. You cannot make a law acceptable that is enforced obnoxiously. Those thirteen men who went before the Virginia Legislature with bleeding hands and wounded hearts demanding that the Examining Board be wiped out, that they might put out their shingles, even though not qualified, believed they were voicing public sentiment; and they forced the repeal of an obnoxious feature of the law. I am now working for the unification of State dental laws.

Examine my student if you want to, but when he has passed once let him go; don't torture him to death forever and eternally.

DR. H. H. JOHNSON: The question has been raised, Is there

any conflict between the boards and the colleges? I do not mean to say that all the men composing the college faculties individually antagonize the Examining Boards or the National Association of Dental Examiners, but there are many men whose words have weight who are utterly antagonistic. There are mutterings; there are whispers; there are outspoken words; there are bitter feelings. It has been said on this floor that there is now no conflict; that everything is serene; that the National Board of Examiners had overstepped its bounds, but had retracted. But that is a mistake. The National Board of Examiners at Saratoga last year adopted the standard that the colleges had adopted. They asked the colleges if they still intended to carry out that agreement, asking them to sign certain blanks stating that they would carry out what they themselves had adopted. It seemed to be necessary to urge them to do what they had promised to do.

DR. COWARDIN: Will you allow me to ask one question? Was it not a reflection upon the college faculties, when they had adopted a standard, to ask them *if* they intended to carry out what they had promised? That in itself was enough to bring about a conflict.

DR. JOHNSON: They simply wanted the signature of each college to the agreement.

DR. COWARDIN: By what law did they claim the right to ask such a thing? It was enough to rouse antagonism of the bitterest kind.

DR. JOHNSON: It did not amount to that much at all. If a college signed an agreement to adopt a certain standard, and then failed to carry it out, refusing to do what it had promised, then that college should be dropped from the reputable list. It has been claimed that the National Board of Examiners had no powers, no influence, no standing, no anything. In that case, what effect would it have had for the board to drop the college from the list? The claim has been made by leading journals that there is no use for examining boards; that there never has been any use for them. I claim that there has been, and still is, a need for examining boards. If we do away with examining boards we take away all stimulus from the colleges. I have been glad to hear that admitted here. At the meeting at Old Point Comfort last summer the Association of Faculties went back on everything they had done before; the whole meeting was one of retrogression. They wiped

out the standard; they said it was done in order to reconcile differences. Then a committee was appointed to fix a standard, to which the examiners must agree. We will do so and so, and you must agree to it. There was no conference in that. If the examiners were simply to accept what the faculties adopted, there was no use in having any meeting at all. They proposed a lowered standard, because some colleges said they could not live up to the higher,—a standard to be gradually raised until graduation from a high school should be required in 1901,—and yet some of the most prominent colleges absolutely refused to subscribe even to that standard; they would not lower their dignity to subscribe to anything in agreement with the National Board of Examiners. And yet those very colleges already have a higher standard than that, but simply from what I call spleen they would not sign anything.

DR. COWARDIN: I rise to explain my position, and mean no offense. I simply wish it understood that my college is not included in that list.

DR. JOHNSON: What I have stated is a statement of facts established beyond a doubt; not with any desire to rouse antagonism. I believe this thing will yet blow over, and that good feelings will be established between the colleges and the boards.

DR. JEWETT: I also rise to a question of privilege. The statement was made that there was at one time apparently a conflict between the two national bodies. I would ask Dr. Johnson if it is not a fact that the Board of Examiners adopted a preliminary standard which had been adopted by the Board of Faculties at Saratoga, but that at Old Point Comfort the college faculties were not ready to come up to the Saratoga standard and lowered it? The records will show.

DR. COWARDIN: Did the opposition to the standard come from the Northern or from the Southern colleges?

DR. JOHNSON: It came from the colleges beyond Mason and Dixon's line.

DR. QUATTLEBAUM: I have had no experience either as a member of an examining board or of a college faculty. I have had experience, though, in standing examinations. I think it would elevate the standard of the profession if each one of us had to undergo an examination every five years. It would do no harm to any of us to feel that that was in store for us. If perfectly pre-

pared we would not fear any board. The National Association of Dental Faculties blacklists or drops a college from the list; why should not the Board of Examiners do the same? I am in favor of standing by the State boards. Let us pull together and try to get a high standard.

DR. W. E. WALKER: Prior to my connection with a dental college I had three years' experience in the Examining Board of Mississippi. We had a fairly high standard, and passed about fifty per cent. of those we examined. We rejected but one graduate, and he was suffering from bad eyes and could neither read nor study. The standard is not sufficiently high, but if the colleges graduate only competent men there should be no conflict between the colleges and the examining boards. But in some States the Governor has it in his power to put on the board men who are not competent or of proper character. We had one man on the Mississippi board who became a rank advertiser. We could only get him off on condition that the entire board resign as a body, under pledge not to accept a position on the board again under that Governor. But when the new board was appointed one man was put on who was not a graduate, and who had failed to pass the preceding board. And yet he is now examining others. It is bad when men are placed on the board through political influence. Our State law, however, was prepared by a constitutional convention. An amendment, restricting somewhat the appointing power, passed the Legislature almost unanimously, but failed to become a law, the Governor withholding his signature to the bill until too late for further action, on the ground that it was "class legislation."

DR. A. A. PEARSON: If those who fail are not better than some of those who pass the boards, I pity the balance. I know of one man who possesses a diploma from a reputable college who wrote at the bottom of his examination paper, "i think you ought to let me Pass because i done the best i could." I think it is all right to let a second-year student pass if he can stand a better examination than a graduate. If they turn out such graduates as some I know of, no one knows what they would do if there were no restricting boards.

I don't care how many incompetent men they let in; it is all the better for me if they locate anywhere near me. But I hope the

Alabama board will stay just what it is, and I will help to hold it up.

DR. H. H. JOHNSON: The experience of men on the examining boards is that the colleges are doing much better work now than a few years ago. Their graduates are better equipped. I am satisfied that the colleges are making every effort in their power to raise the standard of dental education. It is also true that the existence of State Examining Boards has been a stimulant to the colleges. I am also satisfied that in the near future there will be no conflict between the National Boards.

DR. B. HOLLY SMITH: There are some points in this discussion that are of great interest to me. Differences have arisen between the National Association of Faculties and Board of Examiners that have apparently not been adjusted to the satisfaction of all minds. Many do not comprehend why these differences should exist. Dr. Johnson made some statements that are not substantiated by facts. If you could go behind the scenes you would see that his explanation is not quite correct. The National Board of Examiners declined to act with the National Board of Faculties in accepting a plan of preliminary examinations outlined by Mr. Dewey, Secretary of the Board of Regents of the University of New York. The facilities in many of the Southern States are not such as to permit of such a high standard of preliminary examination. If the "count system" of the University of New York were adopted as obligatory by the National Association of Faculties, many of the schools in the South would be ostracised. This was made very emphatic at the conference of committees. As secretary, I assumed the responsibility of staying the force of that rule, and that action was supported at the last meeting.

As Dr. Johnson has said, the work of the colleges has greatly improved. Ten years ago we did not have the necessary textbooks. The withdrawal of the "count system" was because it was not understood by many of the members of the board. The present preliminary requirements are fully the equivalent of the "count system," but upon a different basis. It is not a retrograde step, but simply a modification. We must adapt our methods to possibilities; we must be temperate; work evenly and gently up to a more elevated plane. As a matter of personal feeling, I know many of the members of the Board of Faculties, and I know them

only to love them. It is true there are men who always want to carry a point, who have stored-up energy behind them. If others do not see as they do they think they must be disciplined into it. But I contend that these things can all be settled by these two bodies themselves, and we should not say anything here tending to widen the breach. The Board of Faculties and the Board of Examiners are twin brothers; these differences will all melt away in feelings of brotherly love.

DR. J. N. JONES: I received a personal letter from one of the members of the committee, explaining what this course had been, that we, as a board not affiliated with this organization, might clearly understand the position. They stated that they were bound to act in conformity with the rule they had established. But I do think that colleges which have won a reputation should not oppose a rule designed to check up the colleges which are not prepared or fitted out to properly equip students; colleges which have obtained a charter through political "pull," but which are not in position to teach dentistry. But for the Board of Examiners they would turn out hordes of men that the profession would not be proud of. If they will not conform to the requirements of the boards they must suffer the consequences of having their *graduates* rejected, and of not being recognized as reputable.

DR. COWARDIN: Do you consider it the prerogative of examining boards to pass upon the qualifications of a college faculty?

DR. JONES: They can say if the college has not the necessary number of men on their faculty. They can pronounce upon their qualifications by the students they turn out. With sufficient "pull" any one can charter a college, and it could turn out Tom, Dick, and Harry indiscriminately if there was no board to impose restrictions.

DR. ALEXANDER: I rise to a point of order. We are drifting away from the subject. It is not the function of this Association to settle differences between the National Boards of Faculties and Examiners. I move that the subject be passed.

DR. COWARDIN: I rise to another point of order. It is not paying due respect to the President's address. This question is one of vital interest to the harmony of the profession.

DR. BEADLES: Mr. President, the Executive Committee is ready to report the order of business for to-morrow.

THE CHAIR: A report from the Executive Committee is always in order.

DR. S. B. COOK (Chairman of Executive Committee): The Association will meet at nine o'clock and continue the reports of Standing Committees. At twelve o'clock Dr. Fort will give a microscopic demonstration.

Revision of the Constitution.

REPORT BY L. G. NOEL, CHAIRMAN OF THE COMMITTEE.

DR. L. G. NOEL, Chairman of the Committee on Revision of the Constitution, offered the report from the Committee. He said: We have compared the Constitution of the Southern Dental Association, adopted in Atlanta in November, 1895, with the Constitution of the National Dental Association, adopted at Old Point Comfort in August, 1897, and have made such changes in the former as seemed necessary to adapt it to our workings as a branch of the National, harmonizing it with the Constitution of the latter body.

On motion of Dr. S. W. FOSTER, Dr. Noel read those sections of the Atlanta, 1895, Constitution which the Committee had deemed it necessary to revise, and also the sections of the Constitution of the National to which the former were made conformable.

THE CHAIR: You have heard the report of the Committee; what is your pleasure?

DR. CHAS. SILL: As a member of the old American, and also of the old Southern, I am a member of the National. My residence being in New York, I would properly belong to the Eastern Branch, if such shall be organized. But I like to meet with the Southern Branch. What I wish to know is this, Does the payment of dues in a branch exonerate from further payment of dues to the National? Also, would payment of dues to the Southern Branch exonerate from payment of dues to the Eastern Branch?

THE CHAIR: It is my understanding that the payment of annual dues in any branch constitutes full membership in the National.

DR. WRIGHT: And entitles the members of the branches to the publications of the National?

THE CHAIR: That is my understanding.

DR. WRIGHT: In the old Southern there were members from all parts of the country, who went into the National as members of the Southern. But under the present geographical limitations we cannot now elect such men members of the Southern Branch.

DR. NOEL: Any man from New York, or from any other State, can join the Southern Branch if he so desires, and thus become a member of the National Association.

THE CHAIR: My individual impression is otherwise. The Constitution localizes the territory of the Southern division, and, as I understand it, no one outside of that territory can be admitted to the National through the Southern Branch. Of course, all who were already members of the Southern at the time of the organization became members of the National.

DR. NOEL: As a member of the committee which drafted the Constitution, I am in position to say that that impression is erroneous. The subdivision of territory was entirely for the purpose of convenience in holding the meetings of the branch associations, not with any idea of confining the membership of the branches within geographical limits.

THE CHAIR: The view that I have expressed holds in the minds of many, that the territorial limits apply to membership as well as to place of meetings. I had some correspondence with the President of the National Association on this very point.

DR. COWARDIN: I cannot believe that it was intended that a man was not at liberty to go either to New York or to Florida, as best suited his convenience, in order to join the National through a branch. The National gets the benefit of his membership dues no matter what branch he joins. Of course, we could not go to New York State as a body and meet as the Southern Branch, but an individual must certainly be free to join the National Association whenever and wherever a branch meeting best suits his convenience.

DR. SILL: I have no objection to paying my dues annually, but I should not like to be asked to pay dues in several different branches if I wished to attend so many different meetings.

THE CHAIR: No member will be expected to pay the annual dues more than once.

DR. B. HOLLY SMITH: Any man who joins a Branch Association becomes a member of the National Association. Dr. Sill is twice a member, as he was a member of both the American and the Southern when the National was organized from the existing membership of those two Associations.

DR. FRANK HOLLAND: There has been no discussion of the

question of direct membership in the National. It is not equity that there should be such a thing as membership in the National except through a branch. For instance, can a man attend the National in August and pay his annual dues there, and then attend the Southern Branch meeting, say the following February, and pay us nothing? He would get all the benefits to be derived from our meeting, the privilege of the floor and clinics, etc., and pay us nothing for it. And yet we have to turn over to the National three-fifths of all we receive in dues, to which sum he has contributed nothing.

DR. COWARDIN: As I understand it, we are *all* members of the National; but only direct members of the Southern Branch, who pay their dues here, can vote and hold office in this branch. Membership in a branch entitles to all the privileges of the National, but membership in one branch does not entitle to privileges other than the floor in another branch. He has no vote in matters concerning the government of any but his own branch. I move the adoption of the Constitution and By-laws as revised by the committee.

THE CHAIR: You have heard the motion; are you ready for the question?

DR. H. R. JEWETT: The Constitution as revised has been read, but members, including the Chair, appear to hold different views as to its interpretation. Until these differences are reconciled we are not prepared to vote upon its adoption. The Constitution of the National divides the territory into three sections, the East, the West, and the South, the geographical limits of each division being clearly laid down. All members, whether from the East, the West, or the South, have equal privileges in the National, and are entitled to vote and hold office in that body. But each subdivision in organizing a branch adopts its own constitution, providing for its own local government, the only condition being that it must not in any of its provisions conflict with the constitution of the National. In organizing as the Southern Branch our borders are strictly defined.

[THE CHAIR again stated the motion of Dr. Cowardin, that the Constitution as revised by the committee be adopted.]

DR. WRIGHT: I object to the adoption of the name proposed by the committee. We should keep our old name, according to the

resolution adopted at Old Point Comfort. I insist upon it that the committee amend that section. I ask that the Secretary read from his minutes the resolution offered by Dr. J. Y. Crawford, which was adopted at Old Point Comfort.

The Secretary read as follows:

"DR. J. Y. CRAWFORD: I move that we do now declare ourselves the Southern Branch of the National Dental Association, to be known as the Southern Dental Association. Seconded and carried unanimously."

DR. WRIGHT: That is what I insist upon. I call for the question upon my amendment.

DR. B. HOLLY SMITH: I would be the last man in the world to find fault with my friend Dr. Foster, but that was not the form of Dr. Crawford's motion. His motion was, "We do now declare ourselves the Southern Branch of the National Dental Association." There was no stenographer present, and this is simply a question of memory as between Dr. Foster and myself. It was not the thought in the minds of those then present that this Association should be robbed of one particle of prestige, honor, or credit, or that the history of its long and valuable services should be blotted out. But this Association was taking equal part in the formation of a truly National Association, with the object of making it possible to do more effective work. To give it a truly national character it was not desirable to preserve such local associations. We did not resolve to "join" the National; we *formed* the National. To *us* belongs the credit; *we* did it; Southern men did it. I am unwilling to admit that to others belong national honors, to us only local credit. We are the National Association, —the Southern Branch of the National Association. To be known as the Southern Dental Association identifies us only *locally*. There is no excuse for mere sentiment to be allowed to place us in a false position.

DR. FOSTER: Mr. President, I have the very highest regard for Dr. Smith as a dentist and as a gentleman, but I must say that the resolution as I have it written here, and as I read it, is exactly as Dr. Crawford offered it. I was very careful to get it down correctly. I did not get it from Mrs. Walker, our reporter, whose report has not yet appeared in print, though we hope to have it in a few days. I took this down from Dr. Crawford's lips, as he spoke

it, and I feel that I must defend my position in this matter. I do object to having it said that I have not got it down correctly.

DR. W. E. WALKER: I have as distinct a recollection of Dr. Crawford's words as I have of eating my dinner a while ago, and, as surely as I am standing here, the resolution as read by the Secretary is exactly in the words of the gentleman who offered the resolution,—a gentleman who, though a member of the Southern Dental Association, was also twice President of the American Dental Association. I know I have thought of the words at least once a week ever since.

DR. COWARDIN: We have heard the testimony of the gentlemen as to the correctness of the minutes, but that is not the question before us.

THE CHAIR: The question is, what name shall we give this body? Shall it be the Southern Branch of the National Dental Association, according to the report of the committee, or shall it be the Southern Dental Association, Branch of the National, according to the amendment offered by the gentleman from South Carolina, or the name adopted at Old Point Comfort, according to the minutes just read?

DR. WRIGHT: Let us have the old name; it is so nice.

DR. CHAPPLE: I rise to corroborate what has been said by Drs. Foster and Walker. The resolution made a deep impression on my mind at the time, and I am certain that Dr. Foster has it down correctly. But as the fact is that we *are* a branch of the National, I am willing to let it go at that. We are simply the Southern Branch of the National Dental Association; let it so appear. I am willing to go back on the resolution of Dr. Crawford and stand by the report of the committee.

DR. B. HOLLY SMITH: In explanation of what I have said as to Dr. Crawford's resolution, I will say that, having had some previous share in the deliberations on this subject, Dr. Crawford and I talked over this matter at some length, and we thought it wise to call ourselves the Southern Branch of the National Association. It is, however, altogether probable that Dr. Crawford, in his florid oratory, was not satisfied with the simple statement of fact, but in his enthusiasm added the words cited by our Secretary from his minutes. I therefore apologize to the Secretary. With me it was a question of memory after the lapse of six months, based upon the

impressions made by numerous conversations held with Dr. Crawford on the subject and the wording of the name as agreed upon.

THE CHAIR: Are you ready for the question on Dr. Wright's amendment?

QUESTION. (Large vote in the *negative.*)

THE CHAIR: Are you ready for the question on Dr. Cowardin's motion?

DR. QUATTLEBAUM: I would like to hear the section on membership read.

DR. NOEL: No change has been made in that section as it reads in the Atlanta, 1895, Constitution.

DR. QUATTLEBAUM: I am told that the dues are now five dollars, instead of three. When was that adopted? The dues in the Southern were three dollars.

THE CHAIR: That change is necessitated by the Constitution of the National.

(Dr. Walker in the chair.)

DR. BEADLES: According to the Constitution of the National, three-fifths of our revenues go to the National. The dues being raised to five dollars, if we could retain three-fifths and send two-fifths to the National we would have the same income that we had before; and we have never had any too much. I think we should send up a resolution to the National asking for a change in the Constitution enabling us to retain three-fifths for our expenses.

DR. A. A. PEARSON: The National pays the costs of publication; that reduces our expenses.

DR. BEADLES: They did not cost us anything before.

DR. J. P. CORLEY: Do the dues that we pay in the branch entitle us to the Transactions of the National?

THE CHAIR: As members of the National we are entitled to all their publications.

DR. JEWETT: The question before us is the adoption of the Constitution, so revised as to make it conform to that of the National. As a branch we can only recommend that a change be made in the Constitution of the National.

DR. BEADLES: Then I offer a resolution that we recommend that the——.

DR. COWARDIN: The gentleman is out of order. There is a motion before the house.

Failures in Operative Dentistry.

By Dr. L. F. FRINK, Lake City, Fla.

WHO is there among us who does not have failures, and why? I shall attempt to mention briefly a few of the most important causes.

Chief among these is dull instruments; especially is this the case with burs. We defer ordering new ones to a future day and toil on with the same old burs, causing greater friction, more pain, even endangering the life of the pulp, and at last an improperly prepared cavity.

The use of sharp excavators or chisels to pare away the thin marginal walls is necessary, especially at the cervical wall. No first-class mechanic will attempt to finish up a nice piece of work with dull tools; then how much more important is it in this high calling of ours.

We should use the best instruments and replenish our supply of burs often, remembering that however good an instrument it may be it cannot last always.

Again, we have failures from filling in too close proximity to the pulp. I deem it best to leave some discolored dentin immediately over the pulp rather than excavate too near.

In our eagerness to complete a piece of work, and thus obtain the fee, a wrong selection of material is made. A gold filling is used when cement or amalgam is indicated.

This is often done to please the patient. While I always advocate the use of gold, yet there are cases where cement fillings preserve the tooth much better than the metallic fillings.

No gold filling will stand unless thoroughly condensed.

Too often we see the mistake of failure to remove salivary calculus. This brings to mind the oft-repeated injunction of our

honored professor, Dr. James Truman: First examine the mouth, second clean the teeth, then you can see more clearly what should be the treatment. I am truly sorry that in this enlightened age there should be found those having mouths in which, did we not use the scaler freely, we would never find the cavities to be filled. In such mouths the best fillings by the most skillful operators are failures.

Let us impress upon the minds of our patients the grand lesson of cleanliness in the mouth, as well as of the body. When thus educated we will soon find that we have fewer failures in operative dentistry.

DISCUSSION.

DR. W. E. WALKER, Pass Christian, Miss.: I wish to emphasize the importance of sharp burs. That this is really an important element in saving pain to our patients would seem to be an unheard of idea to some men, judging from the dull burs I see being used in some offices. My rule is that if the edge of a bur blade can be seen it is to be laid aside; when they accumulate in sufficient quantity they are sent to the factory to be resharpened.

THE CHAIR: Some burs are so very small that it would seem difficult to see the edge.

DR. WALKER: By holding them up in a good light it can be seen, though in the case of some a jeweler's glass may be needed.

DR. E. G. QUATTLEBAUM: I can't tell anything about a bur until I try it in the mouth. I have a great deal of trouble in that line.

DR. L. M. COWARDIN: Try it on the edge of the nail; if it slips it is no good.

DR. WALKER: That is a very good way, but it is more tedious than holding it up in a good light and looking at it as you roll it over; look across the end as the light shines on it, and unless it has the necessary keen, sharp edge you can see it. In the best burs—the "Revelation" burs—the cross-blades over the top dull the most frequently. If Dr. Quattlebaum would try this method he would avoid the unpleasant results of trying a dull bur on the patient's teeth.

DR. S. B. COOK: I do not think there is much difficulty in recognizing when your bur is dull, and as soon as it refuses to cut throw it away and it will not trouble you again. The "Revelation" burs cut very well for a little while, but they soon get dull, and then you

can't do anything with them. The cross-cut burs are much more satisfactory to me. They cut twice as fast as any others that I have ever tried; they take hold of the enamel. Not a great big, deep paring; they tear it up in little bits of grooves. If you have not tried the cross-cut burs you would do well to experiment with them. I think you would like them very much. One of these will do as much work as three of any other make that I have tried.

DR. QUATTLEBAUM: Who makes them?

DR. COOK: They are an English design, made in fissure and inverted cone forms. I got the last from the Dearborn Dental Manufacturing Company, Chicago. There is also one for enlarging nerve-canals. A cross-cut bur will cut off a front tooth very quickly. Another point in the paper I would speak of is the use of gold when other materials would serve a better purpose. Many teeth can be saved by the use of cement or amalgam that gold would not save. This point should always be borne in mind by the dentist. The matter of larger burs is sometimes a great temptation, but we should always choose that which will do the best service.

DR. CHAS. SILL: Mention was made in the paper of leaving carious matter in the bottom of the cavity. It has been my practice for years, when a cavity is so deep that thorough removal of carious dentin would expose the pulp, to leave a layer over the pulp, covering it with gutta-percha; not dissolving it in chloroform, however, but merely dipping a thin slice of gutta-percha in chloroform sufficiently to dissolve a film on the surface, making it adhesive; then, evaporating the chloroform, lay it in the bottom of the cavity and fill over it. It will do better work than gutta-percha dissolved in chloroform. As a non-conductor, gutta-percha is good anyway you use it.

DR. S. W. FOSTER: The point in the paper which appeals to my mind as of the greatest importance is the care to be exercised in the preparation of margins. Failure in this respect is the cause of more failures in operative dentistry than any other one thing. The kind of material used for filling is of minor importance compared with the proper preparation of the margins of cavities. I wish to emphasize that point; imperfect enamel edges will surely result in undermining caries later on. The average operator is in too great a hurry, and does not give himself time to prepare his margins

properly; he does not give himself time to separate the teeth sufficiently to enable him to get at the margins properly. The teeth should be separated with cotton for several days; there is then space to trim away and round up the margins. Whether the material used is gold, cement, or amalgam, success depends upon the proper preparation of the margins of the cavity.

DR. H. H. JOHNSON, Macon, Ga.: The fissure cross-cut burs originated in Germany. In 1890, when I was traveling in Europe, I got hold of a half-dozen, which I used with great satisfaction. I have not been able to find the same grade in this country until very recently. They are a very superior bur, and any one who tries them will be perfectly satisfied with the results obtained.

DR. L. M. COWARDIN: I regret that I was not here to hear the paper, but in the discussion I have heard reference made to leaving decayed dentin in the bottom of the cavity when——

DR. WALKER: The essayist used the words "discolored dentin;" he did not speak of decayed dentin.

DR. COWARDIN: I did not hear the paper, but Dr. Sill spoke of leaving decay when the pulp was near exposure, and capping with gutta-percha. I feared the impression was general that that idea was indorsed in the paper. In my earlier practice it was my custom to leave semi-devitalized dentin in the bottom of a cavity rather than destroy the pulp, but the result was a succession of abscesses and other disagreeable conditions, pulpitis, etc. I am happy to say that with my present practice I rarely have an abscess as the result of a dead pulp. I now remove everything except sound dentin, regardless of pulp exposure, and especially from the bottom of the cavity. If the pulp is that near exposure I destroy it, remove it, and fill the canals. I never leave any decayed dentin in proximity to the pulp. If I did I should expect trouble to follow.

DR. QUATTLEBAUM: I never expose a pulp if I can avoid it by leaving a layer of semi-devitalized dentin, which I thoroughly sterilize. Then I varnish the cavity, put in a little cement, with gutta-percha over that, and I have fewer abscesses than any man with whose practice I am familiar. The trouble with others probably comes from not sterilizing the dentin; if left septic it must, of course, give trouble. It must be rendered aseptic, like any other foreign material near an exposed pulp.

DR. FRANK HOLLAND: How do you sterilize it thoroughly? How long does it take?

DR. QUATTLEBAUM: I do not leave any great quantity of it, and I apply pure carbolic acid—ninety-five per cent. There is nothing better than that.

DR. COWARDIN: Carbolic acid will not sterilize it unless through its escharotic effect. It will coagulate albumen, and by that means injure the pulp, so that sooner or later the result will be a diseased pulp. At least, that has been my experience.

DR. SILL: For sterilization I use hydrogen peroxid. It is more thorough in its action than anything else I have tried. In a very few moments its action on the parts is complete. In an experience of three or four years with this method I have had no such trouble as when I used creasote or carbolic acid.

DR. L. G. NOEL: I am something of a disciple of Dr. Flagg in the removal of all diseased dentin. If, however, I nearly expose a pulp in excavating, and there has been no peridental inflammation, no inflammation of the pulp, I may leave a little softened dentin in the cavity and sterilize it. I do not want to kill a pulp that is in healthy condition.

DR. COWARDIN: You do not consider a pulp diseased unless there has been peridental inflammation?

DR. NOEL: I do not consider that it is not amenable to treatment unless it responds to tapping. If there is inflammation of the peridental membrane I treat it with beechwood creasote. After treating it with creasote for a day or more I place hydronaphthol cement in the bottom of the cavity, without any other cavity lining, unless it is that recommended by Professor Flagg—pure caoutchouc dissolved in chloroform, or gum mastic in chloroform. The latter makes a very satisfactory cavity lining. Hydronaphthol, used as recommended by Dr. Stowell, makes a very satisfactory pulp covering, mixing one-third hydronaphthol powder to two-thirds of any cement powder, mixed as any ordinary cement. I have used this in fifty or sixty cases of actual exposure without a single case of subsequent trouble.

DR. J. N. JONES: Do you employ the same methods where there is inflammation?

DR. NOEL: It is necessary to wait until all peridental inflammation has subsided.

DR. FRANK HOLLAND: You say you treat for a day or two with creasote; what quantity?

DR. NOEL: I use it quite liberally, first saturating the cavity walls; then I put some on spunk or cotton and seal it up in the cavity from one sitting to another. It is surprising how promptly the inflammation will subside. But if it refuses to abate within forty-eight hours arsenic is the proper application.

DR. B. HOLLY SMITH: I feel that it is quite possible that a good deal of our treatment is done empirically. If I had to treat diseased soft parts in which there was inflammation, as the eye or the mucous membrane, dermal surfaces, and especially when there was any liability of an exposed nerve, and it should be suggested to me that I try the effect of escharotics,—agents which destroy tissue,—such a suggestion would make a peculiar impression on my mind. I know that nitrate of silver is used by oculists in the treatment of that most delicate organ, the eye, but I must say that I think we have gone too far in the use of such concentrated agents as carbolic acid, creasote, etc. I often wonder that the parts will stand as much as they do, and I feel that our efforts at sterilization are not effective because it is impracticable to keep such agents in a sufficiently concentrated form in contact with the tissues a sufficient length of time to secure the desired result. Merely wiping out a cavity with carbolic acid cannot sterilize carious dentin. This can only be effected by repeated applications, or by leaving it in contact a long time. Sealing it in as a temporary filling may perhaps render it aseptic.

DR. QUATTLEBAUM: If the cavity is thoroughly dried by blasts of warm air, why will not pure carbolic acid, which has a great affinity for water, penetrate those dry walls and sterilize the dentin?

DR. B. HOLLY SMITH: I am not prepared to say positively that it will not do it. But it will soon erect a barrier against itself, preventing any further penetration. If a cavity has been once medicated with carbolic acid it is useless to treat it later with any other agent; it would not be effective. Hydronaphthol in alcohol will penetrate more deeply than carbolic acid.

DR. QUATTLEBAUM: Much depends on the depth to which you want it to penetrate. I propose to leave merely a film of decalcified dentin to avoid actual exposure of the pulp.

DR. B. HOLLY SMITH: I am not indorsing any particular drug,

and I may be entirely in the wrong; but I ask if it is not the judgment of the gentlemen present that we do use too powerful agents, and in too concentrated form? What is the *rationale* of such treatment? What are we trying to effect with carbolic acid? Are we working intelligently? Do not our *failures* indicate that some other line of treatment is needed? Hydronaphthol has powerful antiseptic qualities. Even then I do not know but that hydronaphthol and powdered cinnamon might make an efficacious aromatic antiseptic paste. I understood you to say that was what you used. But I really believe our tooth-medication is too radical, and that we should proceed more cautiously.

DR. QUATTLEBAUM: I acknowledge that I was taught by Dr. Flagg not to use carbolic acid, but in my experience it has proved to be good practice, as shown in the results.

DR. B. HOLLY SMITH: Cicatricial tissue is not favorable to the return of the pulp to normal conditions.

DR. FRANK HOLLAND: I wish to add that I am probably not as careful in my manipulations as Dr. Quattlebaum, who applies powerful escharotics to a film of semi-decalcified dentin in the bottom of a cavity; but I am very sure that if I did that I should kill the pulp. (A VOICE: You're right.) In trying to kill out the microbes with carbolic acid you imagine you are sterilizing the dentin, but you don't do it; you simply anesthetize the nerve; you can put it on any delicate tissue and absolute anesthetize it. That is why death by swallowing carbolic acid is the most painless known. On the line of Dr. Smith's statement, that our methods of treatment are too radical, I would say that, although nature is a great restorer, I cannot agree that the use of so many powerful drugs in the treatment of dead teeth is necessary.

DR. NOEL: Dr. J. S. King, of Pittsburg, many years ago called my attention to his method of pulp-capping, which I adopted and have used successfully in hundreds of cases of traumatically exposed pulps—exposed in excavating I mean. It was simply a small quantity of pure creasote made into a paste with the powder of what was then called os-artificiel. I used oxid of zinc, mixing it to a consistence somewhat thicker than cream, and applying it directly to the pulp, first saturating the cavity with the creasote, after washing it out with warm water, and then filling with oxychlorid of zinc over that; later the oxyphosphate came in. In my

own mouth I have a tooth in which an exposed pulp was treated in that way many years ago and filled by Gordon White. You are at liberty to examine it, and I guarantee that you will find that it is a live tooth to-day. Since reading Dr. Stowell's article I have modified my method by using hydronaphthol, as I have described, but there has not been sufficient time to settle the question of superiority over the old method which I used for twenty years. Dr. Flagg has said that if the pulp does not die after exposure there will be a formation of secondary dentin, a recalcification of the decalcified tissue. He says he has repeatedly found this to be the case. I have never had occasion to remove any of mine, so I cannot say whether or not that is the case.

DR. JONES: What about the dentin that has been medicated with carbolic acid?

DR. NOEL: I do not use carbolic acid. As I have said, I use only pure beechwood creasote.

DR. HOLLAND: I can kill the pulp every time with three applications of creasote; it is even more escharotic than carbolic acid.

DR. QUATTLEBAUM: If carbolic acid is as powerful an anesthetic as has been stated, it ought to be a good application for sensitive dentin.

DR. WALKER: You appear to mean that as a joke, but Dr. J. N. Crouse, of Chicago, recommends the alternate application of carbolic acid and tincture of aconite, as desirable obtundents for sensitive dentin. I have tried it, on his recommendation, and find it very satisfactory.

The Educational Features of the Dental Association.

By J. PERCY CORLEY, D.D.S., Greensboro, Ala.

THE accomplishment of a profession is limited only by its standard of education. Education in its highest sense is that preparation of mind and body which best qualifies an individual for the achievement of the greatest possible degree of success in his chosen calling. The classics are only a gymnasium where mental forces are trained, acquiring strength by exercise and precision by discipline. Thought crystallizes into action, action into personality, personality into character, and character is the status of the man.

"Were I so tall to reach the pole,
Or grasp the ocean in my span,
I'd be no larger than my soul:
The mind's the measure of the man."

The three great educational factors are the journal, the college, and the association. The dental journal, whose editorial sanctum enshrines the very highest model of literary and scientific art, with its mammoth waste-basket to which is consigned everything of questionable value, with a circulation that illuminates almost every dental office in the country, and spreads before the most obscure practitioner the Elysian fields of science, whose hidden paths are traced by the finger of God, is certainly the vanguard in our march of progress. It is a veritable Achilles shield, which comprehends within its circle almost every subject which touches our professional lives. Beyond a doubt, our dental literature has contributed more to the advancement of the profession socially and scientifically than any other department of the educational regimé. And

as an outgrowth of its influence we have the college and the association, whose multiplied charters, high curricula, and chaste code of ethics are a great source of pride to every son of America.

The dental colleges, which stand as beacon lights in almost every State in the Union, embody in their instruction an ideal foundation for both a technical and scientific education. The utility and grandeur of the superstructure is limited by the breadth and security of its foundation. The *Alma Mater* of dental science, as in every art, is nature. The college professor is simply the vessel which bears the inspiring draught to our thirsty lips. He ought to be, and often is, an artist, with instinctive genius for discerning the scattered forces of our nature, and arranging them in harmonious accord. And then there is about the ideal college professor a personal magnetism, a kind of hero worship, if you please, which touches the hidden springs of the student's soul and wakes into life and activity all the splendid possibilities of an inspired life.

The momentum which a noble ambition gives a man who is well equipped for the march of progress overcomes every obstacle, and from every defeat reaps a harvest of success. The college has a direct bearing on the personnel of the profession. Remembering this most important fact, we will fold the much-prized parchment which is to testify to the world that we are Doctors of Dental Surgery, and pass out of the college doors into the world of action.

Well do I remember when I walked into the office of one of my professors, six short years ago, with my diploma in my hand, and with a throbbing heart asked him for his parting benediction. He gave it to me, and it was this, "Attend the Association." I could but poorly appreciate its value then, but to-day if you ask me for the most worthy advice that I ever received I would tell you it was this. And it is my purpose in this paper to emphasize some of the most important features of association work; all of which is necessarily educational. The association is a great confessional where we recount our failures, pointing to where the hidden reef lies beneath the glassy surface. We bring our problems and ask advice. We also bring the treasures which are gathered as we climb the rugged steeps and scale the mountains of difficulties. Thus the association is a great storehouse, which holds within its capacious vaults the accumulated wealth of hundreds of lives of study and toil. And each member is a stockholder, just in pro-

portion to the zeal which he has for the advancement of his profession and his ability for assimilating the grand truths which it teaches. It is a kind of professional Mecca to which we make annual pilgrimages to pay tribute at the shrine of mutual progress, and acquire strength and preparation for the ever-increasing responsibilities of life.

One peculiarity of the dental profession is that upon its shoulders rests the burden of educating the public. There is scarcely an institution of learning to-day which has not in its curriculum a comprehensive treatise on physiology and hygiene, with its campus and gymnasium for the cultivation and development of the sinews of the body; but the oral cavity, which is decidedly the most important department in the animal economy, is passed with scarcely a thought. The tooth-brush is more important than dumb-bells, and dental sanitation the first step in the hygienic routine. I hail with pleasure and commendation the efforts of the members of the Tennessee Association to introduce the tooth-brush and a comprehensive text-book on dentistry into the public schools, and to require their teachers to familiarize themselves with this most important part of physical culture. If this most excellent object is ever accomplished it must come through the combined efforts of the profession, through the medium of the association. I admit the need of dental surgeons in the United States army and navy, and trust that in time this office shall be added to the military regimé; but the nursery needs dental attention more than the garrison, and the schoolboy more than the soldier. The proverb, "Train up a child in the way he should go, and when he is old he will not depart from it," holds as good in the physical as in the moral world. And the sooner we recognize the boy as the father of the man, and the baby as our most important patient, the sooner we will reach the ideal in dental achievement.

It is not my intention to throw bouquets at the "association crank," but I say with impunity that our incomparable advancement on purely scientific principles, and our magic strides in the path of progress, could not have been accomplished independent of the association. Let us learn a lesson from the little coral insect, so insignificant in the abstract, but whose associated and combined forces build an island for the habitation of man.

The Southern Division of the National Dental Association

stretches her dominions from the busy ports of Delaware to the broad acres of Texas, and has among its members men who stand at the top of the professional calendar, and whose names are an insignia of success,—men endowed by nature with splendid ability, which, under the inspiration of ambition and a devotion to their profession, have enlightened the world by original research, and built monuments whose inscribed columns shall guide posterity.

I have heard it said that the Association consisted of the egotists seeking for office, the college professor electioneering for students, the inventor advertising his appliances, and the depot man peddling his wares. I do not deny that much of the Association work is done through motives not entirely disinterested, but what of that? If a man is qualified to serve his profession in an official capacity, and render more efficient service to his fellows than some other man, it is surely his duty to use all legitimate means for the attainment of such a position of usefulness and honor. I have the pleasure of a personal acquaintance with several ex-presidents of the "Southern," and they are, without an exception, an honor and a benediction to the profession.

It is also the duty of every dental college to let the profession know what kind of material she has in her faculty, and to demonstrate the advantages offered. If you should take the college professors from our councils, we would have crape on our gavel.

As to the inventor, it is kind of him to show us his appliance and teach us how to use it, thus saving us the expense of investing in something which we might be unable to use to advantage.

And the depot men confer genuine favor on those of us who live in the country by their magnificent display of all the paraphernalia of our profession. So we see that these accusations which are brought against the Association are no discredit.

The eighteen States and Territories which comprise the Southern Division of the National Dental Association contain about six thousand practitioners of dentistry, and it is safe to say that one-third of these are eligible to membership in the Association. Our roster should show two thousand instead of two hundred names. This would give us in annual dues six thousand dollars. We could appoint and equip special committees for scientific investigation along certain lines, a practical demonstration of which might be given the Association. We might establish

and maintain a journal for the publication of our transactions and the collateral sciences, as the National proposes to do. We could secure cheaper transportation and hotel accommodations, thus reducing expenses, which would enable us to increase our dues to the Association.

One great fetter which binds most of our societies is pecuniary embarrassment. If our annual dues were twenty-five, instead of five dollars, the achievements of the Association would be multiplied in much greater proportion. We have few members whom this would cost more than a day or two of work. The Secretary of one of the best State Associations in the country told me last week that he was being compelled to advance money for the publication of a transaction which had been on his desk for ten months.

There ought to be a greater premium on Association work; I mean the public ought to require every practitioner to attend. And upon us as individuals rests the task of educating them along this line. Then they will be willing to pay us better fees for the more efficient service which we are able to render.

To the executive officer of the present session and his able corps of assistants I extend hearty congratulations for the success which their untiring zeal and united efforts so richly deserve. May this convention mark the dawn of a new era in dentistry, which shall spread as the morning light until the dark shadows of ignorance and superstition shall have given place to the glory of intellectual day.

The social, intellectual, and clinical features of the "Southern" have stood for years without a parallel. Let us then build upon the prestige of the past a "Parthenon" for the future.

I trust that you will pardon sectional pride when I declare that nowhere on the face of the earth has manhood grown to a more perfect stature, or womanhood bloomed with so radiant a beauty, as here in our beloved south-land, where the very atmosphere is laden with the rich aroma of a sweet perfume. The Wise Creator did much for every clime, stamping upon the canopy of the universe the impress of His artistic being, and filling the art galleries of humanity with the sculptured beauty of many a rare and beautiful soul, but when the Lord made "Dixie" He did His best. The ideal dentist is an incarnation of German learning, French art, English thoroughness, American push, and Southern chivalry.

DISCUSSION.

DR. FOSTER: I do not know that I can say anything that would add strength or force to this paper. I have always loved that boy, and feel proud that he has presented a communication of this character. I was especially pleased with his defense of the college men and the depot men, and the part they play in Association work. The depot displays add very much to the value of our gatherings. Their exhibits are a practical educational feature to those who do not have daily access to our city depots. They bring to the meetings many who would not come solely for the scientific work. They come to see what is new, and to find out what they ought to have. And when the depots are closed they drop in and hear the discussions, and so are doubly benefited. But, to give them the full benefit of the latter feature, the depots ought to remain closed while the discussions are going on. As to the teaching element, it cannot but be admitted that the college men contribute much to the interest and value of our work. Dr. Corley's points are well taken.

DR. H. H. JOHNSON: The paper read was a good one, and the society is to be congratulated on such a paper. If I may be pardoned for alluding to dental journalism (being connected with a journal, I feel a little hesitancy about touching on this point); but I do believe that the dental journals have done as good work along educational lines as any one other thing. The dental journal goes right into every office, a white-winged messenger, bringing tidings to every brother. We should deal with them more liberally; let each man tax himself to contribute both to their pages and to their support. It is a duty that each one owes to the journalism of the profession.

DR. B. HOLLY SMITH: The optimism of this paper is exceedingly gratifying. I have almost fallen in love with myself in finding myself in such delightful company. It sometimes occurs to me, as I go about with my satchel filled with models and things, that perhaps I may be regarded in a critical spirit. I thank the essayist for his kindly expression of feeling toward those who make up the Association membership. It is gratifying to feel that I am an integral part of this good whole.

Dental Education from a College Standpoint.

By J. A. CHAPPLE, D.D.S., Atlanta, Ga.

AT the request of your Committee on Dental Education to submit a paper from a "college standpoint," I assumed the task reluctantly, conscious of my inability to discuss the subject as it deserves, and for the additional reason that he who assumes to champion the cause of dental colleges has much of popular prejudice to overcome and contend with, however fair and conclusive his argument may prove. But, of late, so much has been charged against dental colleges, and so little offered in their defense, I assume the rôle of defendant, in the sincere hope that I may be able, in a degree, to dissipate this prejudice and to bring about a more cordial relationship between the discordant factions. And in the outset I desire to assume personal responsibility for what I shall say, for I do not presume to speak as a representative of any college, or to voice the sentiments of the college fraternity at large.

Time will not permit, nor, indeed, is it necessary, that I should undertake to discuss the subject in all of its bearings, but will simply invite your attention to a review of *four* general propositions, which constitute the ground for the prejudice and opposition already referred to.

The profession at large has drawn up an indictment against colleges in which it is charged:

(1) "There are too many dental colleges,"

(2) "The preliminary requirements for entrance of students are inadequate,"

(3) "There are too many students annually turned loose upon the country," and

(4) "The colleges are conducted solely from motives of pecuniary gain."

(1) Are there too many dental schools?

We can only answer this question by comparing the number of dental schools with those of other closely allied professions. In the report of the Commissioner of Education for 1895 and 1896, we find that there were in the United States 144 schools of theology, 73 law schools, 155 medical schools, 44 schools of pharmacy, and 46 dental schools. Making 98 more theological, 27 more law, 109 more medical, and but two less pharmaceutical schools than dental schools. Have you ever heard any complaint against the number of schools of theology? And yet they graduate annually a greater number than the dental schools. And it must be remembered that but a small percentage of ministers are graduates in theology, there being no law to compel them to attend such schools. Instead of any opposition to them on the part of the ministry, it is a matter of pride and pardonable boast among them that they have such institutions, and where the schools fail to be self-sustaining the ministry rally as one man to their support.

Have you heard of any serious complaint among the attorneys as to the number of law schools? And yet a larger number of law students are annually graduated than dental students. And it must be remembered that only about twenty per cent. of attorneys hold law diplomas,—there being no law to compel them to attend such schools. Every state has its university, or state college, with law department attached. These colleges are more or less endowed by the state, which, of course, make annual drafts, in the way of taxes, upon every lawyer in the state for their maintenance.

Being more closely allied to the medical profession, we hear occasional complaints against the number of medical schools; but since charlatanry is more openly practiced among them than in other professions this opposition is natural and amply justified by the facts. I make bold the assertion that the dental profession is responsible for the number of dental schools.

In all dental legislation, and there is now scarcely a State without enactments for the protection and promotion of dentistry, special emphasis has been laid upon those desiring to enter the profession. Remove these legal restrictions, and allow the dental student the same privileges as those enjoyed by the legal student, and the den-

tal student will seek the nearest private office for instruction, and but few would avail themselves of dental schools.

A manufactory of drugs and medicines does not increase the number of drug stores, nor produce disease. But it is disease in a rapidly increasing population that renders the manufactory a necessity. The establishment of a dental school does not encourage or increase the number of dental students,—popular opinion to the contrary notwithstanding. Rapid and cheap facilities of transportation have so wonderfully annihilated time and distance as to eliminate them entirely from one's calculations when contemplating a dental education. To illustrate this point, and to emphasize it, we cite the fact that two Southern States send more students to Northern colleges than to the dental colleges in an adjoining State.

Dental colleges exist, therefore, because of a demand; and I sincerely believe I do no violence to truth when I assert unqualifiedly that every self-respecting practitioner, deep down in his conscience, is proud of the fact that there were forty-six dental colleges in the United States in 1895-96.

When charged by the uninformed that no special preparation is required of a student; that we have no literature worthy the dignity to be called such; that we are simply mechanics; how quick would you be to repel the charge, and offer in rebuttal the number of dental colleges we have, the curricula adopted by the same; the percentage required for graduation, and the final appearance of the graduate before a State Board? And would you not take pride, also, in refuting the charge, in naming the text-books and current literature of the profession? And the question naturally arises, Who are the authors of our text-books and current literature? Without almost a single exception they were and are college men.

Not but that non-college men could have done quite as well, perhaps, but, since we are dealing in facts and not fiction, the truth of history, past and present, demands that we state them correctly.

Take from our literature the products of Chapin Harris, Abbott, Gorgas, Taft, Essig, Garretson, Flagg, Kirk, Black, Marshall, and others and of what could you boast? And these authors, with two exceptions, are in active college work to-day. As for current literature, the exponents of the best thought and purest aim are conducted by college men.

Before you would hurl your criticisms against colleges and those

connected with them, think for a moment what they have contributed to your own present position and future possibilities.

(2) The second indictment charged is that the preliminary requirements for entrance into dental schools are too low.

In taking issue with this charge we emphatically declare our belief in the highest possible intellectual attainment as a condition precedent to the pursuit of any professional career. But, we ask, is it fair to exact of dental schools more than is required of other schools of similar character?

The majority of law schools in this country do not require a preliminary standard, nor is there a law or legal board to enforce one. I read you an extract from a letter received from the dean of a recognized leading law school. He says, "There is no requirement of scholarship for entrance into this department." Speaking of the number of students who had matriculated in his school he declared with refreshing candor, "only one has not had a fairly good education, at least as good as the high school can give," and yet this comparatively illiterate student, having pursued the prescribed course of study, within one year's time, is awarded a diploma.

Indeed it is not made obligatory to attend a legal school at all; and about seventy-five per cent. of practicing attorneys avail themselves of three months' study in a private office, when an examining committee declares them thoroughly competent to practice a profession which has been justly esteemed as ranking at the head of all professions.

What do the schools of pharmacy require? The Secretary of the State Board of Pharmacy of Georgia, in reply to my inquiry touching the qualifications of matriculates, says, "All of the best schools require a grammar school education, at least, and a few, high school certificates." But it is not necessary that even a student of pharmacy should attend a pharmaceutical school at all. The recently amended law of Georgia—and no one will deny that Georgia is a progressive State—declared that "it shall be the duty of the Georgia State Board of Pharmacy to grant license; first, to druggists who after three years' experience in a drug store managed by a licensed apothecary or pharmacist shall have passed a satisfactory examination before the said Board of Pharmacy."

It will be observed that the student who desires to become a

pharmacist is not only exempt from any preliminary requirement, but a diploma as well, provided he satisfies the Examining Board of his State.

What do the medical schools require of matriculates? A member of the Georgia Medical Examining Board, a distinguished surgeon of my State, writes me, "All medical colleges that are members of the American Association of Medical Colleges, or the Southern Association of Medical Colleges, require a literary standard conforming to that of a second grade teacher's license." Which is about equivalent to a high school certificate.

We thus note that the law schools have absolutely no preliminary requirement. No law to compel students to attend a law school, but on the contrary can pursue a three months' course of study and obtain a license to practice.

The schools of pharmacy, and only "the best of them," to quote my informant again, require a high school certificate, and the medical schools have about the same standard.

The dental schools have been operating for the last few years with a high school standard or teacher's certificate.*

Is it possible, in the light of the facts here cited, that the charge in the second indictment can be sustained or justified?

If our sister profession with such a foundation can afford to undertake the education of physicians, who may hold your life in their hands, should not dental schools be allowed the same privilege? If law schools can afford to undertake the legal equipment of men for the serious work of advocating or construing the law, with no preliminary requirement at all, should not dental schools be allowed to exist under the present order of things?

Law and medicine, twin sisters of science upon whom civilized society depend, absolutely, for all that makes life worth the living! The one makes and construes the law and defines your personal and property rights, while the other is intrusted to care for that which is the most precious heritage vouchsafed to man,—life. If upon a basis of no education at all, with one, and a high school certificate as a basis with the other, upon which to equip men for such extraordinary responsibilities, is not the present preliminary standard entirely sufficient for a dental education?

In certain quarters the effort is being made to raise even the

*Or requiring an entrance examination in the absence of such certificates.

present standard. In thickly-settled centers of population where all the avenues of trade and professional life are congested, it is possible for dental schools to be self-sustaining; but in less favored sections, where the literary standard of public schools is perhaps not quite so high, it is unfair to attempt to enforce a uniform standard of preliminary requirements.

It is safe to affirm that ninety per cent. of dentistry is purely mechanical. We would respectfully inquire, therefore, to what extent a knowledge of "Greek Classics in English," Cæsar's "Commentaries," Cicero's "Orations," Sallust's "Catiline," Homer's "Iliad," or Xenophon's "Anabasis," would assist the dentist in constructing a bridge, filling a tooth, or treating pyorrhea? We venture the assertion that the men who have contributed the most to the mechanics of dentistry never translated a sentence in the Iliad or demonstrated the hypotenuse of a right-angle triangle.

No one questions the force, power, and elevating influence of education; nor are we opposed to even a higher preliminary standard, but we do affirm the time is not auspicious for its enforcement now. To adopt as a whole the standard required in New York State would, in our opinion, force many schools to surrender their charters and thereby subject them to a loss, which, in all equity, would be manifestly unfair. Let the standard be raised by degrees, year by year, with the addition of a certain course of study which tends to a *practical* training of the mind rather than to a development of *literary* culture. Those who are over zealous in their efforts to urge sudden and radical reforms on this line, should remember that reforms are not brought about in a day. Rome was not built in twenty-four hours.

The penal system of England, at one period, resisted for years the demand for a reform. Press and pulpit alike were unavailing, it appears, until Reade wrote his well-known novel, "It Is Never Too Late to Mend," which proved of such irresistible argument as to finally compel a change in the system.

The schools have not been slow to adopt suggestions for improvement, and while they are not perfect and not entirely exempt from criticism, yet it must be conceded that they have made creditable progress, and have ever shown a willingness to act in harmony with all *reasonable* demands.

(3) The third charge in the indictment—that there are too

many students annually graduated, and turned loose upon the country—is equivalent to the assertion that there are too many students studying dentistry.

We note in the authority just quoted, the report of the Commissioner of Education for 1897, which is the latest report issued,—that for 1895-96 there were 9780 law students, 24,437 medical students, and 6339 dental students. This shows 3441 more law and 18,098 more medical than dental students. To reduce this to its logical conclusion, where, perhaps, the force of the statement can be better appreciated, these figures show one law student to every 7157 of the population; one medical student to every 2864 of the population, and one dental student to every 10,940 of the population. This ratio of the number of students to population is approximately the same as is the number of practitioners to population. Thus, when it is remembered that every inhabitant does not require the constant or even casual services of a lawyer or a physician, but that ninety-nine out of every one hundred do require dental attention, how can the charge be reasonably sustained that "too many students are annually turned loose upon the country?"

But what are the causes for the increasing numbers who seek dentistry as a means of livelihood?

I charge the profession, and not the colleges, as largely responsible for this increase, and there are three principal reasons which conduce to this end.

First. The stringent legal requirements of the State laws regulating the practice of dentistry, which make it virtually compulsory upon every student to attend a dental school. These laws have, indirectly, forced the colleges to higher curricula, and this higher standard has attracted a correspondingly better educated class of students, who are more solicitous of a respectable professional degree than for its practical or material benefits.

Second. The over-crowded condition of other professions has been no mean factor in swelling the number of dental matriculates. The vast number of attorneys who are forced to surrender their legal privileges for the lack of clients, and the meager support realized by the average physician, are sufficient to deter the man who seeks a profession, not alone for the dignity of the name, but for remunerative considerations as well.

Third. The advent of crown- and bridge-work, with its com-

paratively large fees, has been and is the most potent and active influence in attracting students to the profession. Every college man realizes the truth of this proposition, as he has almost daily proof of it.

The student upon first entering a college is anxious to be initiated,—not into the elements that enter into the primary structure of a tooth, nor into the depths of bacteriology, but into what are to him the profound and sublime mysteries of crown- and bridge-work!

But it is urged by the anti-college element that the number "annually turned loose upon the country" creates competition and a consequent abridgement of their income. While we believe this to be largely imaginary, and not susceptible of conclusive proof, we lose nothing to accept it as a fact, because, if it be true that the struggle for ascendency is greatly accelerated by reason of constant additions to our ranks, dental colleges alone do not stand convicted as the sole and exclusive promoters of competition. It would be a serious reflection upon the intelligence of this assembly were I to attempt to show that every trade and profession, without a single exception, were unwilling martyrs and victims to the saying that "Competition was the life of trade." From the banker to the ragpicker in the streets, competition has been an enemy hard to overcome.

To adequately provide for, and to overcome this influx of new bidders for "fame and fortune," what is to be done?

The solution of this problem rests in the education of the masses to a correct appreciation of dental hygiene. If ninety per cent. of the population are in constant need of dental attention, but only about two per cent. avail themselves of it, no further proof or argument is needed in support of this proposition.

Realizing the urgent necessity for some means by which the public could be enlightened and brought to see the importance of a proper care of their teeth, the last meeting of the Georgia State Dental Society appointed a committee to draft a text-book on dental pathology and hygiene and urge its adoption by the public schools of the State.

In our efforts to disprove the foregoing allegations we have been almost wholly sustained by facts and figures, which, to any rational mind, should leave no room for serious denial.

Fourth. But in our effort to combat the fourth and last charge in the general bill of indictment, in the nature of things, we have no recourse to statistics or very tangible evidence.

To charge that the colleges are conducted solely from motives of pecuniary interest, without proof to sustain the charge, calls for no labored attempt to disprove it upon the part of the defendant, since all rules of law make it incumbent upon the prosecution to prove all charges. We are not disposed, however, to avoid the issue and seek refuge behind a technicality, for we are willing to admit that, as a broad proposition, in this very practical age but few are lending their time and talent without some remuneration; and hence the charge has some foundation in fact. But the writer is cognizant of facts, which, fortunately for him, can be unqualifiedly corroborated by testimony which cannot be seriously questioned.

There is no doubt but that in a few instances the organizers of dental schools shared the popular belief that there were millions to be made out of them, and it is possible some have made it profitable. On the other hand, there are many, very many, employed in college work to-day who would cheerfully surrender their positions but for financial obligations incurred in conducting the schools, and the sacrifice of professional pride. Be it said to the honor of some, however, that financial considerations are subordinated to a natural desire and special aptitude for teaching. Many find their greatest pleasure and recreation in college work, and it serves as a diversion from the routine of an exacting office practice. Indeed, the writer has personal knowledge of men who are daily sacrificing the income of a large practice in order to gratify their inclinations in this work. When the time lost from one's practice, the expenses incurred in maintaining the college, and the interest upon the amount invested in college equipment are taken into consideration, there is but little if any surplus for ordinary, much less extraordinary, demands.

But suppose the charge in the indictment is true, "is not the laborer worthy of his hire?" Are men engaged in theological teaching alone from religious or philanthropic motives? Are the medical staffs and attaches of the various charitable institutions of the country discharging their respective duties without compensation or hope of material reward? Dental colleges are institutions

made possible by reason of a rapidly developing profession. Somebody must conduct them, and that, too, with a remuneration commensurate with the time and labor rendered.

In conclusion, we invoke your sympathy, moral support, and co-operation in building up rather than tearing down reputable dental colleges. We ask that you put capable, fair-minded men upon your respective State boards who will act in harmony with the schools, but at the same time protect your own interests as well.

Conscious of our imperfect and crude defense, we crave that charity and indulgence which covereth a multitude of faults.

DISCUSSION.

DR. H. H. JOHNSON: This paper is an education in itself. To say that it is an able paper, and that time and labor have been spent in its preparation, would but faintly indicate its merits. I am glad to have had the opportunity of listening to such a paper. I must, however, take issue with some minor points, which I will indicate in my humble way. I had never made such a comparison as this of our profession with others. I had recognized for some time that dentistry was leading the other professions in many ways. She was the first to institute a three-year course; medicine followed closely after. But I had not thought of tracing the comparative progress along other lines. I am now impressed by the fact that our progress has been even greater than I thought. But is that any reason why we should relax our efforts? Is that any reason for us to hesitate about still pushing forward, still keeping in the lead? For a long time American dentistry has led the world; modern dentistry had its birthplace in America; other countries have hesitated about keeping pace with us. America was the first to establish dental colleges. Are we now going into bonds? In Italy every American dentist must now have the Italian M.D. In England a four years' course is required, and the preliminary standard is very high, almost a classical education. We are dropping behind instead of keeping in the lead. We cannot afford this. We must raise the standard of preliminary requirements. We have not yet reached the highest pinnacle, that we should cease to aspire to better things. A wrong impression has gained ground with the people, that we are clamoring for a higher standard in order to restrict the number seeking entrance into our ranks. I

quote from Dr. Chapple's figures that in 1885 there were less than five hundred dental students in the United States. Last year there were more than six thousand. Think of it!

DR. B. H. SMITH: I doubt those figures, and I judge from statistics that have been published in the dental journals, and which were obtained from the Bureau of Education. In the "American System of Dentistry" may be found the number of graduates—some hundreds—in the year the volume was issued—for that one year only.

DR. H. H. JOHNSON: It still stands as a fact that the number of dental students has increased more rapidly since the standard has been raised. The fact that the standard is higher has not decreased the rate of admission to our ranks. (DR. CHAPPLE: I made that a point in my paper.) Raising the standard and increasing the time have resulted in increased attendance at the colleges. The increase may not yet be equal in ratio to the increase in population, but it must be borne in mind that it requires a larger clientele to support a dentist than in any other occupation. If the work for an intelligent patient is thoroughly well done to-day he may never require your services again, or, at most, but slight attentions, and those far apart. Again, a large portion of the population never seek the services of the dentist; another large portion are unable to avail themselves of our services. They are forced to let the teeth go one by one, until all have been extracted. Then they may perhaps have a good set of teeth made, and we never see them again. But if a man has fever to-day and the physician cures him he may require his services again next week, and probably twenty times during the course of the year, so that fewer patients are necessary to support a physician well. In law a man may receive several thousand dollars for a single case. It is for this reason that the profession of dentistry must necessarily be numerically crowded.

DR. A. A. PEARSON: If there were seventy million people, I would not care if there were seventy million dental students. Educate the people to appreciate and to care for their teeth, and the dentists will always have plenty to do. New ones are continually coming into my town, but I do not see that they affect my practice at all. If too many ever do come there it will be all the better for me, for I will have them to work for. Dentistry should

not be compared to theology, for a preacher can live on nothing, or where any other man would starve to death. I am not in favor of raising the standard of educational qualifications so high that a young man can't get in at all. I see no use in crowding his head full of things that will never be of any use to him. I would rather trust myself in the hands of a man who has good common sense, even if he doesn't know much about books, than to a fool who knows all there is in the books but has no common sense. Let the standard be raised to the point of admitting no one who is not strictly a gentleman, but don't go crazy after literary attainments. There are many men who are natural-born dentists, and they are a benefit to humanity. And there are many college graduates who are fit for nothing but tramps, and that is what they are and what they do—tramp from one State to another. I would be glad to see the dental profession on a higher plane, but you can't get it there merely by literary acquirements.

THE CHAIR: If there were seventy million people and seventy million dentists, where would the patients come from?

DR. PEARSON: Why, they would all be working on each other, of course. And there would be enough to be done over again to keep them all busy; and about nine-tenths of them would get disgusted and go into some other business, and the few that were left would get it all to do. (Laughter.)

DR. WALKER: I move that the privilege of the floor be extended to Dr. Woodbury, of Nova Scotia, who is with us.

THE CHAIR: I am happy to introduce Dr. Woodbury to the members of the Association, and I hope he will avail himself of the privilege of the floor which I am happy to offer him.

DR. FRANK WOODBURY, Halifax, N. S.: I thank you for your courtesy. I wish I had known that in coming here I should meet with such a gathering of professional brethren as this. I would then have been the bearer of greetings from our own Association. We shall meet in August, and I hope I may have the pleasure of meeting some of you there, both ladies and gentlemen.

DR. B. HOLLY SMITH: I don't want Dr. Johnson to think that because of his great size I am afraid of him; I am prepared to maintain my position. In regard to the large number of patients that are necessary to keep a dentist employed, why three or four fillings are a good day's work. It is *not so* that there is any one that does

not require our services, and surely no clean, decent man would go a whole year without visiting a dentist. Work once done *does not* last forever. The best plate is not expected to last a lifetime. There are many sections of the country where people ride from three to five miles to obtain dental services; are not such sections of the country neglected? And do we not need more dentists to serve these people? Some men are ambitious, and satisfied to locate only in the most populous or the wealthiest centers; but there are others who are satisfied with a more humble lot. The dental profession is not yet so crowded that students must seek some other calling. There is legitimate occupation for all, even if they can only emulate the country doctor, with his humble practice of two thousand or twenty-five hundred a year. Let the young dentist do the same, and be satisfied with two thousand a year. The time may come later when he can legitimately move into some large city and make his five, six, or seven thousand dollars a year.

So far as a higher training of the mind affects a man's success in the practice of dentistry, I do not know of a subject a knowledge of which would disqualify me for my profession. The man who knows the most will make the best record. Not that the degree A.B. or M.A. is a prerequisite to success in dentistry; the man whose earlier training has been that of a jeweler, an electrician, whose mind has been trained along mechanical lines, will often give the greatest promise.

The Johns Hopkins University has a selective course of studies as preparatory to certain branches,—studies which have a relation especially to his future training. I feel that I must cross this hall and shake hands with Dr. Pearson (suiting the action to the words, amid great applause) for his grand words, "admit none but gentlemen." There he struck the keynote, though it is a fact we must admit ladies as well. (Applause.) It is not possible to make gentlemen of all who aspire to dental honors, but it is possible to give a stimulus to the gentlemanly impulses implanted in the home by moral training and the enforcement of the Code of Ethics. I hope more attention will be given to training our students in ethics. Take them into our homes, into our families, to our churches. Of course, we cannot follow them up at all hours. A young man must stand on his own feet, but we can try to inculcate moral

principles, the way of right living. I am glad to say that that kind of teaching is popular in the dental schools.

DR. J. Y. CRAWFORD (who had arrived during the reading of the paper): Will you let me speak? I have not yet paid my dues.

THE CHAIR: We will stand for you, and be glad to hear from you.

DR. CRAWFORD: I have been going to dental societies for twenty-four years, and have heard many papers read, but I want to say that I indorse every single proposition in the paper under discussion. It is the truth, the whole truth, and nothing but the truth. No argument is necessary to prove the magnitude of dental surgery as compared with the other professions. A number of years ago the American Dental Association met at Excelsior Springs, Mo. There was a much larger body in attendance than is present here. I made an argument there in support of a high standard; to cut out the men who have never been to a dental college, to restrict others. The truth is that the obligation to register is a good thing. A large percentage of the men now in practice have not had the necessary education; the college graduates are getting their business away from them, and they are the ones who have originated and organized the opposition to dental colleges; it does not come from the National Board of Dental Examiners. It is to the American Dental Association that are due the laws requiring the registration of practicing dentists. It struck me like a clap of thunder that the argument for a higher standard of dental education could be construed as an appeal to the selfish nature. Why, the more poor graduates are turned out the better it is for your business, if you are a competent man. You go out in St. Augustine, or any other city, and hunt up three typical cases, say young men of seventeen or eighteen years old, who have never been to the dentist; let one of them go to the cheap dental parlors; let another keep away from the dentist, but have such medical services as he may require; let the third place himself in the hands of a first-class dental practitioner, one whose standard is high, with correspondingly high prices; which of the three will have spent the most money for these respective services at the end of fifteen years? More than seventy-five per cent. of the American population need dental services; and in just that proportion do they need the most skillful service. I am going to uphold the teachings of

that paper because it spoke the truth. Education is not, and never has been, and should not be made, a question of *time*. Some men can acquire more in ten minutes than others in ten weeks.

DR. FRANK HOLLAND: Dr. Johnson has traveled in Europe; he located for a time in London. I would like to have him tell us about the technique of dental education in England; how it compares with the American system.

THE CHAIR: I am afraid we are getting away from the paper. The field is so broad and branches out so widely. There is too much in it for us to hope to cover the whole field and get through with the rest of our business. Dr. Chapple now has an opportunity to close the discussion, if there is no objection.

DR. CHAPPLE: I have no reply to make, as there has been no attack. I have not been a frequent attendant at dental conventions, but, as a rule, discussions are too frequently devoid of facts or proofs; generally mere glittering generalities. Having been requested to give my views on dental education from the college standpoint, I thought it well to investigate the matter closely, and to ascertain the actual facts, as far as they can be gathered from published statistics. As to the correctness of my figures, I have given them verbatim; I have made no wild assertions; every statement made can be substantiated from evidence at hand. The proof that I am correct is that you have agreed with me; you have complimented me in accepting my paper. The gentleman from Alabama——

DR. PEARSON: No, sir; you don't need to reply to me. I felt very safe in attacking your statements, for I know you don't want to go to Montgomery. (Laughter.)

Dental Literature—A Heretical View.

PAPER BY D. R. STUBBLEFIELD, D.D.S., NASHVILLE, TENN.

MR. PRESIDENT AND GENTLEMEN OF THE ASSOCIATION: It has been several years since I had the pleasure of appearing before you, if I may call the assistance of him who courteously represents me now as an appearance. Nevertheless, though kept away by a sickness of a serious nature, my heart has always been with you, and in spirit I have cordially joined your meetings.

This year, however, through the flattering kindness of our most zealous President, I have decided to present some views upon a subject suggested by him. In this prologue I wish to exonerate him from any possible complicity in my personal views as set forth. Indeed, I think I might go further and declare that he outlined a perfectly opposite view from my own, and therefore must be responsible only for having brought me out by personal attention. If I am the only "mistake," however, that he has made in all the myriad things he has done, then I am sure we ought not to blame him. I, for one, do not, and, giving him the right hand of reconciliation, I declare that I hold no malice against him.

Below will be found my honest convictions. If they are nobody's but mine, I shall not hold it personal for any one to just as freely criticise them as I have candidly, though briefly, presented them.

As a seer, I see a vision. I see the latest, youngest of the learned professions confident in her present position, as well as in her promising future. Behind her a past which, while filled with the struggles that produce strength and the mistakes that purify, is undoubtedly one to be proud of. There are now living those who all but officiated at her birth, and certainly assisted her toddling

steps along her early years. From being despised by the narrow and intolerant skepticism that dominated even the best in other branches of knowledge and research, she has fairly gained the intelligent appreciation of the best and wisest in the world. From being denied the least association with the arrogant pretenders to all respectability, she has aspired and attained to equal merit and equal honor with all professions. Medicine, who formerly held aside her skirts, if she did not also hold her nose in the presence of this ambitious youngster, has graciously deigned to allow the claim of blood-relationship to be announced unchallenged.

Law, that musty aristocrat, who superciliously looked askance at everybody who did not wear a gown and wig, has so far unbended that he calls upon expert exponents of this new profession to throw light upon obscurities. General Science, unsociable, self-centered crank that she is, has also gravely acknowledged that this young claimant has just right to a seat among the mighty. Indeed, it may be said with confidence that dentistry has gained by merit alone the respect and honor of an acknowledged equality with all who love the truth and seek it. I repeat, it is unquestionable that this condition of affairs has been the outcome of intrinsic worth, without which she could never have gained her present honorable position in the world's esteem.

But with all her worth, with all the claims which entitle her to just appreciation, it has been alleged that she has been unable to develop a literature worthy of her name and fame. Is this true? Many men of many minds will hold diverse, not to say conflicting, answers in mind to this question. As far as I am concerned, I am of the opinion that her literature is all right, is as good as her nature and relation to the world at present will permit.

Before I give my reasons upon which I base my views, let's ask the other side to speak out. They say it is a disgrace that we have no better; that the journals should be only the pure fountains from which professional refreshment only could be drawn; that the plane upon which the present literature is placed is one of commercialism and beneath the dignity of so proud a science. Such outcry is all folly. Without meaning to, they ask for a building of professional literature to be built without a foundation. They want the kite of professional literature, which should be held to the earth with a necessary cord, to become a balloon that shall fly the

professional firmament without let or hindrance. They wish an Utopian dream whose beautiful, esthetic parts and specifications have only the unsubstantial fabric of a dream for bones and sinews. They clamor for a fire to blaze without fuel; a factory to run without force, and a *mare* without *money* to make her *go*. This is their wish, in a word.

On the other hand, what have we to say? First, the nature and essence of dentistry limits its literature as well as its work. The greatest stumbling block in the way of social recognition, so to speak, of dentistry by the allied professions was that it demanded of its followers *manual labor*. This is a rock on which many a proud craft has split in the stream, so called, of society, and the end unfortunately is not yet. But as to dentistry the claim or imputation cannot be denied, because it inheres in the very nature of our calling. There may be cotton-picking machines and typesetting machines, but there will never be tooth-filling machines that do not stand on human feet and use human hands. It is impossible as it is unnecessary to attempt denial. So, then, if this manual part is intrinsic, vital, indissolubly a portion of our calling, we must expect it to limit us somewhere, somehow. We need not be surprised, then, when we find it exerts its influence upon our literature, and candor compels acknowledgment. The abstract can only be thoroughly understood by the most skilled intelligence, and, whether we like it or not, it must be confessed that the average of our specialty is not highly cultivated or skillful in mind. Illustration is a universal language, and, with few limitations, reaches the intelligence, whether weak or strong, uncultivated or cultivated. Therefore, that which is written must be illustrated to certainly and quickly reach the comprehension of all. Bring it home to every one of us and say if it is not true that we appreciate what we *see* better than what we *hear*, and better than either what we see and hear at the same time? The teachers have long since recognized this fact. For this very reason you will find the number and excellence of demonstrators in the colleges is always rising. In fact, the progressive teacher is in himself both professor and demonstrator in fulfilling a conscientious discharge of his obligations. The last application of this truth is that our literature must forever abound with illustrations of what the matter discusses.

It may be claimed in seeming opposition that certain journals

have existed, or do exist, whose sole idea is to appeal to the mind by the utterance alone. The "Brief Bits for Busy Brothers" or the "Delicate Daily of Dental Doings" may lay some claim to this exceptional nature; but if this question is to turn upon such excerpts of literature, without considering their excellence at all, then it is too narrow to be discussed broadly. They have their place and their value, and ought to be appreciated; but as compared to the large idea of a professional literature, they are only star dust, not stars. If what we have advanced above is true, it must be evident that our professional literature must forever be an illustrated literature, especially along its newest, freshest lines.

The second point is that it is all right now as it is, because none but money-making enterprises can publish such journals; and they are now in the hands of such institutions. The cost of publishing in any event is great, but when illustration, new and original, is added it is much greater. The experience of every man who has been associated with any printing enterprise will bear out this statement. It takes money and lots of it to keep the "devil" and those engaged with him from striking. And the artist has been a hungry mortal from the foundation of the world. This is a practical fact, this one of money being needed, and not a theory, and success or failure hinges upon it. It is all very well to dream of a philanthropic publishing house whose roaring presses and quiet editorial rooms will produce Utopian literature, but life and dreams, though much alike, will ever differ in practical matters. No; either the profession or some one connected with it—interested in it, if you prefer—must put up the cold cash to publish our journals. Who of the profession will do it? I might ask, who of the profession is able to do it, however philanthropically minded he may be? What dentist has the purse of Fortunatus and the heart of an Atkinson? It seems that they do not consort together. Dentists prove in one way, if no other, their title to be professional men by the fact that, while they live well, they die poor. They are not able to have a literature if they depend on their own resources, and, while we may quibble and writhe under it, we cannot get beyond the solemn fact. Therefore it naturally devolves upon the money-making concerns interested in the profession. Instead of vilifying them, therefore, I, for one, think we ought to hold up their hands, yield our willing gratitude, and, as far as possible,

back their enterprises cordially. I dare say, if the whole truth were known, that there never was a journal that paid its publishers from the start. It is a very cold, uncomfortable thing to send good money after bad, and it requires interest as well as money to hold the courage to the sticking place. These reflections may not be brand new, but they are nevertheless true, and as such are entitled to our honest consideration.

The third point is that the journals are excellent as now published, and present the contributions to our literature fairly and well. There can be no real argument built up against this statement. They gladly print whatever the profession utters when it bears the signs of honest conviction and is new enough to take. If you want better than that, write it yourselves and contribute it. The greatest trouble is the publishers call for *bread* and you give them a *stone;* you expect *brick*, but you give them no *straws*.

As to the commercial contamination of which complaint is made, pray state how does this corrupt? We can easily explain the why of this condition from the publisher's standpoint; and yet if we can point out the direful spring of this horrible mortification to the profession it may be the generous publisher will see his crying iniquity and do better. If the advertisements offend our esthetic taste, and yet have a vital purpose to fulfill, let us keep our eyes off them and they will not seek us. Let them stand or fall on their merits or lack of them. Our position in this regard reminds me of the old German who objected to the soldiers bathing almost two miles away, because "Mine gals has got a sphy-glass." We are too sensitive entirely under the circumstances, and make ourselves needlessly unhappy. Let us confine our minds to those fresh articles collected with such effort and expense by the publishers for our delectation, and "observe, compare, reflect, record." If we will only digest the palatable viands arrayed monthly or at other intervals in the journals, we will not starve. Our professional bodies will get round, ruddy, and robust, and our professional minds will grow fresh, full and facile, and up-to-date in all respects. But I doubt not if some great dental trust should arise, formed by the monthly contributions to a sinking fund, and should publish, with its unlimited resources, an ideal dental journal for the free use of all the profession, that it would still abound in cuts of the new things and wise utterances within its columns.

Dental Literature—A Few Criticisms.

Paper by D. E. WIBER, M.D., D.D.S., Washington, D. C.

Mr. President and Gentlemen: To even a superficial observer of such matters, it must be plainly evident that dental literature to-day holds a position of so much importance to the profession that without it we would be like an unmanned bark upon an unknown sea, without chart or compass to aid us.

Its growth has been proportionate with the art and science it represents; from a crude beginning, its progress has been remarkable. From this simple origin, when material was meagerly supplied, when societies were in their infancies, and few in comparison to what they are to-day, when the majority of dental operators guarded jealously the knowledge they had obtained, lest their competitors should appropriate and apply it to a useful end, our literature has risen to a state of prominence which makes it an indispensable and potent factor in the dissemination of knowledge to the dental world and the elevation of the profession. It is to-day our pride.

Less than a decade ago the statement was publicly made by a prominent dental operator, in one of our scientific journals, that dentistry had been written out. With the recent writings of Drs. Black, Cryer, Williams, Miller, and others before us, we need hardly pause to comment on this remark; current literature successfully stamps the utterance as a fallacy.

One noticeable and pleasing feature during the past year was the quality of the literature presented. During no other year in the history of dentistry have the literary contributions of the profession maintained such a high standard and healthy condition. That it is capable of still further improvement no one doubts. The higher average dental education and the standard for admittance

required by our colleges of the present period has and will have a marked influence on the excellence of the papers presented at our society meetings, and, altogether, the retrospective and prospective views are highly pleasing ones.

Each issue of our dental journals is taxed to its limit in the effort to accommodate the matter sent it or obtained, and several times during the year just closed we have witnessed the necessity of added pages in order to give space for original communications and society proceedings. This latter department is an important feature of our literature, and its possibilities cannot be overestimated.

Important discoveries and the results of individual researches are usually presented first to local or State societies, but eventually, by their merit, find their way into the press, and are read, *or should be*, by the thousands of dentists who find time from their practice to read current happenings in dental literature.

I have but recently received information, from a source that cannot be questioned, that few dentists, in comparison to our medical brethren, read their journals or text-books thoroughly. They may be subscribers and owners, but they say that their time is so taken up with their business that few spare moments are left them to read or study. Now, this is certainly a deplorable condition of affairs, and yet we have no way of compelling them to read, for what might be said in the way of a rebuke to these people in a paper of this character simply falls upon the ears of the faithful and undeserving.

The exigencies of a dental practice demand that we read and study; there is not a dental journal published in this fair land of ours which does not contain somewhere on its pages a hint or suggestion that will be of benefit and worth more each issue to the reader than the price of its yearly subscription charges. We realize fully the fact that there is much published that is valueless, but the reader himself must to some extent separate the wheat from the chaff, and endeavor to absorb that which is good.

We view with pleasure the efforts of several of our dental educational institutions in encouraging the establishment and publication of college journals. This is progress in the proper direction, and a means which will subserve to develop the young mind to think and write correctly, thereby adding another prominent

feature to future dental literature. As the moot court in our legal institutions assists the young barrister in his efforts to present and plead his case, so will dental college journals teach our young matriculants to observe, prepare, and present matters dental. We sincerely hope to see this work encouraged, and would urge that dentists, graduates of those schools having college journals, subscribe and aid the cause whenever and wherever they can.

The number of dental text-books published last year was not as large as it has been in preceding years, though what they lack in quantity is fully met in quality. We have had during the interval referred to the issuance of several standard works, which should be in the hands of the majority of our profession. Here, again, the dentist is remiss. The titles of several well-known works pertaining to dental subjects could be mentioned, and proof given you, if necessary, that there remains on the publishers' shelves the greater portion of the first edition of these text-books unsold. Yet when the profession was consulted in reference to the publication in book form of this valuable literature the answer was, publish them by all means, but their purchasing power was greatly attenuated.

It has been intimated that our colleges are not careful enough in seeing that their matriculants are properly equipped with suitable text-books, and that many dental students brag that they did not own a book while pursuing their course at college. We are surprised that this evil exists, and believe it is only necessary to bring it to the notice of the proper authorities to have it corrected.

Of the several dental text-books published during the year 1897 I shall endeavor to give an impartial review, that you may know something about these publications, if you do not already.

One of the first works to appear, and which contains many advanced ideas and thought, comes to us from the far West, entitled "A Practical Dental Metallurgy; a text-book and reference book for students and practitioners of dentistry," by Dr. J. D. Hodgen, San Francisco, Cal. This excellent work has received favorable press notices everywhere, and should be in the hand of every practitioner of dentistry who would know something practical and useful regarding the metals with which he works. Dr. A. W. Barrett, of London, England, favors us with a manual which treats the subject of dental surgery in a brief form. This work, while it is well written, and the subject explained in a thorough

manner, does not come up to the standard of excellence recently attained by an American writer who has lately presented his views and mode of treatment of this subject to the dental operator.

The seventh edition of Richardson's "Mechanical Dentistry," edited by Geo. W. Warren, D.D.S., is of recent issue. This work but partially covers its field. It lacks order in the arrangement of subjects, and brings out too prominently ideas and processes which have but limited application, while more important subjects are neglected or only imperfectly presented. Up to within a brief period this work stood alone as the authority on dental prosthesis, but, since the advent of another and more intelligent work on the same subject, it appears lacking in many essential features; and, unless rewritten with an idea of making it more modern, we fear that it cannot be rightfully considered a leading text-book on the subject of mechanical dentistry. The new American edition for 1897 of that unrivaled text-book, Gray's "Anatomy," thoroughly revised and profusely illustrated, is a model of completeness. Many of the necessary alterations in the text and illustrations, which in previous editions of this work made it incomplete for the dental student, have been corrected and brought up to modern times by that eminently qualified dental writer and investigator, Dr. H. H. Burchard. That this work should be intrusted to one of our number should be a source of great satisfaction to those of us who are interested in the status of the dental profession.

By far the most important dental publication issued during the past year was that edited by Dr. Edward C. Kirk, assisted by eminent American authorities. The "American Text-Book of Operative Dentistry" is, without exception, the leading work of its kind in this or any other country. The work is not perfect, and can and will be improved. We believe that in omitting crown- and bridge-work and including chapters on orthodontia a grave error was committed, and hope that in forthcoming editions this question will be considered and deemed of sufficient importance to be corrected. Each contributor has presented his subject with conscientious care, but all fail to treat the subject of prophylaxis. The chapters are not arranged in a manner conducive of harmony, and the indexing, a most important feature of any literary work, contains several errors which in subsequent editions will undoubtedly be corrected. As every writer and author knows that

the work does not exist that doesn't contain errors, we should not exercise ourselves too much over the few that occur in this text-book. We have full confidence in the editor of the work, and know that forthcoming editions will be thoroughly complete.

Dr. Marshall's "Manual of the Injuries and Surgical Diseases of the Face, Mouth, and Jaws" is another important addition to our literature. Dr. Marshall says this book is the outgrowth of several years' experience as a teacher in medical and dental colleges. It is intended as a recitation book, he being impressed with the disadvantages of the ordinary didactic methods. Each chapter is closed with a list of questions without answers for the students. The germ theory of disease is as well set forth as we have ever seen it, and one desiring this important knowledge will find it in this book, well condensed and clearly stated. This excellent work is slightly outside the pale of every-day dentistry, and it is a question whether the average dentist may have ambition to take up the practice of such surgery. Indeed, it is with many a question whether it had not better be left to the specialist, but the man who wants surgical work, and is ambitious to be a Marshall or a Garretson, has in this text-book ample opportunity to study the theory of such operations as made these men famous.

Dr. Henry S. Nash, of New York, presents a work on "Loosening Teeth, or Chronic Alveolitis (Pyorrhea Alveolaris)." The book is well worth a careful perusal, as the writer's knowledge of the fundamental principles of cellular pathology and the relations of malnutrition to local disease processes is fully brought out. His descriptions of the variations of the numerous pathological conditions found in the oral cavity are clearly stated, and his observations correspond closely to the latest writing on this subject. Yet his conclusions are erratic, and appear contradictory. In the chapter on pulpless teeth the author appears in a bad light; he speaks of having filled one root of an upper molar, the nerves in the remaining canals being still alive; the tooth consequently ulcerated after remaining nerves died and was extracted. We cannot but think that he was in error to fill one root of a molar before he had removed all the pulp-tissue in such a tooth, even though some evidence of vitality in the other roots remained. Unless many of the unsolved problems which appear so often in the first volume of this work are answered in the second volume, we do not believe

that this literary effort will rank with similar works on this subject.

"Tin Foil and its Combinations for Filling Teeth," by Henry L. Ambler, M.D., D.D.S., is a small book which is worthy of more general perusal in the dental profession and more careful study than it is likely to receive. Not that it contains any especially valuable new information, but because it calls attention to the value of a material which is far too generally neglected. As a literary production the work might be deemed open to some criticism, but the same may be said of more ambitious works. The impression left after reading it is that the force and value of the book might have been enhanced if the author had devoted somewhat less space to quotations from other writers and gone more fully and deeply into original work upon his subject; but what he has done has been done well. His arguments are sound; his directions in regard to the use of tin in filling cavities, both alone and in combinations, are plain and correct, and the book can be honestly and conscientiously recommended to the general and careful perusal of the dental profession.

As you will observe, I have not discussed or reviewed all the dental literary productions of the year 1897, but I have endeavored to set before you an impartial view of the most prominent dental works published during that period. There is much for us to achieve in the way of dental literature, but, as discoveries go on and the acceptance of theories promulgated by the learned of our profession, the matter will adjust itself.

The Prostitution and Abasement of Dental Practice.

PAPER BY W. W. H. THACKSTON, M.D., D.D.S., FARMVILLE, VA.

COINCIDENT with the employment of the Patent Office as an auxiliary in dental practice and usage, and the introduction of vulcanized rubber in our prosthetic work, began a decline all along the lines of social and moral appreciation of the character and value of scientific and legitimate dentistry,—a dentistry that was accepted and acknowledged all over the civilized world as worthy of approval and imitation; and, in contradistinction from the practice of foreign countries, had won and gracefully worn the honored title of "American dentistry." The American dentist who was worthy his calling was not only respected and sustained by public sentiment and patronage at home, but was received with open arms and full hands in all the courts and capitals when he went abroad. Kings, emperors, and noble men and women, princes and princesses, comprised his clientele. Our schools and colleges were in successful operation; our literature, standard and journalistic, was dropping from the press its gems and jewels of research and discovery, lifting and broadening the area and adding to the resources of our calling. Our best men banded together in organized societies and associations, and from their annual meetings scattered broadcast the fruits of their thought, labor, time, and money. But, alas for "American dentistry," the "rubber patentee" and his inseparable comrade and co-worker, the charlatan and "Cheap John," put in an appearance; and first the dentists themselves were hunted, harassed, and bled to the tune of hundreds of thousands, if not millions, of dollars. And with the patentee came the "Cheap John," with his newspaper and magazine advertise-

ments, illustrated by great pictures of teeth and instruments, and the offer of skilled and painless service upon fabulously cheap terms. There is hardly a newspaper or magazine of any description, secular or religous, political or literary, the columns of which are not stained by quack dental advertisements and their show pictures; and there is hardly a household or family in our broad land where these papers and advertisements are not daily or weekly read with seductive interest and effect. The announcement of elegant "dental parlors," splendid equipments of the latest styles, painless operations, full sets of teeth while you wait at from three to five dollars, all work warranted and guaranteed as first-class, as the operators are *graduates* of the *dental colleges*, etc., all of which is accepted and acted upon by the great majority, who desire to grip their dollars and find cheap and painless relief for their dental ills and needs.

It is said that in some instances the newspapers and other advertising publications are now refusing to print and publish communications exposing the character and quality of the "dental parlor" men and their work, upon the ground that the "Cheap Johns" are their best patrons. They advertise extensively and liberally, while the honorable practitioner does not advertise at all. Whether this statement be altogether true or otherwise, we cannot ignore the fact, for fact it is, that the professional charlatan and fraud, through the agency of the press and his cheap rates of charge, is now more in evidence than in any former period of our history or experience.

In most of the cities, small towns, suburban and rural districts of our country the "dental parlor man" and his *graduated assistants* are engrossing public interest and attention, and rapidly demoralizing social appreciation of skilled and honest professional service. In the great cities, where wealth, culture, and refinement may be found, the skillful and honest dentist can win and hold his clientele, and finds his calling a benefaction and a "bread-winner;" but with the moderately circumstanced, the relatively uncultivated, who comprise the "great majority," cost and price are the controlling and deciding questions, and it is not extravagant to make the assertion that legitimate, honest, and decent dental practice is now all over the land menaced and contested with a boldness and success wholly unprecedented. Many of our good and reputable representatives are having their practices cut in twain, and the larger half

going to the "dental parlors" and "Cheap Johns." True, in the olden time we did occasionally hear of a "cheap dentist," but they were a "feeble folk," and crept through society almost by stealth, often afraid to confess that they called themselves dentists. But now, with printer's ink, personal impudence, and association with graduates of our schools and colleges, they are arrogant and defiant; and, more than that, we have to admit that they are achieving a startling success in the abasement and prostitution of dentistry as a profession.

Now, Mr. President, this portrayal of existing conditions has been made with an object and purpose. The problem to be solved and the question that confronts us at the present time is this, What shall we do, and what measures shall we adopt, to arrest or checkmate the assaults now being made upon the interests and welfare of dentistry as a recognized science and liberal profession? We have thought that a remedy was largely within the grasp and control of our college faculties and our dental examining boards, if concert and harmonious co-operation could be secured in these two professional bodies. Next to his cheap rates of charge, the strongest and most effective card the dental parlors man plays from his pack is the number of *dental college graduates* in his employment as assistants or partners in his establishments. Some of these are, of course, frauds, but it is indisputable that others *are regular graduates* and hold diplomas from reputable colleges. The colleges have been severely censured and unjustly criticised for graduating such characters; but is it just or reasonable to hold a college faculty responsible for the subsequent moral or professional transgressions and obliquities of their graduates and degree men? As well, and justly, might we hold an upright and honorable father responsible for the vices, follies, and crimes of a wayward, degenerate, and corrupt son or daughter.

Dental schools and colleges are vital to the interests and progress of our department of general science, but they can neither put brains in an empty skull or graces and virtues in a corrupt and depraved heart; but this they can and should do, for their own reputation and credit, for the welfare of the profession, and the protection of society at large. The colleges should be cautious and circumspect in matriculating students, in conferring degrees, and granting diplomas to graduates. No student, however brilliant his

accomplishments, should be graduated who does not give *reasonable* promise of a professional career unstained by dishonor or by moral or professional obliquity. As a rule our college faculties are composed of gentlemen of intelligence and of acute and clear perceptions; they are good judges of human character, and their opportunities for observation through a college course of three or four years are ample for forming a just and satisfactory estimate of character, as well as qualifications for practice.

It occurs to us that a requirement should be made upon the graduates of all reputable schools and colleges teaching dental science to sign, before receiving their diplomas, a written or printed pledge, to be attested by the dean or president, and filed in the archives of the school, to faithfully observe and honor the "Code of Ethics" adopted by the National Dental Association and by all reputable schools, and in default thereof to surrender his diploma to the school from which it was received, and have his degree revoked by publication in the annual announcements of his *Alma Mater* and the secular newspapers of his place of residence.

The examining boards of each State might, with a little additional labor and trouble, co-operate with the faculties of the schools, by notifying them of any lapse, irregularity, or violation of the "Code," or any disregard of the graduating pledge and covenant coming within the knowledge and under the observation of the board of examiners on the part of any graduate of a reputable college.

I submit these suggestions in the hope that something better may be evolved and put in operation to check the "flood tide" of abasement and prostitution that is now disgracing and dishonoring the dental profession and bringing unmerited reproach upon our educational institutions, for it is the graduates and degree men who are giving some show of respectability and attractiveness to the "dental parlors" and professional "junk shops." The illiterate and untitled "Cheap John" *of* and *by* himself would cut but a brief and sorry figure, but reinforced by the college graduate, with his diploma conspicuously displayed to the admiring gaze of all in search of painless dentistry at rates of unheard-of cheapness, the enterprise flourishes and the co-partnership is a financial success. The time has now come for the "brakes" to be put on and set hard upon the traitorous graduates of the dental colleges.

Report of the Committee on Hygiene.

By WM. ERNEST WALKER, D.D.S., Chairman,
Pass Christian, Miss.

AS Chairman of your Committee, I regret to have to report that the most diligent efforts on my part have failed to secure more than one paper from the members of this Committee,—namely, a paper entitled "Dental Hygiene," by Dr. J. W. David, Mexia, Texas, which I herewith offer you. Failing in my efforts to secure papers from the Committee, I availed myself of the privilege conferred in Section 2, Article V, of the Constitution, and have "corresponded with others;" as the result of which I have obtained and offer you a paper from Prof. S. W. Foster, Atlanta, Ga., entitled "Hygiene."

Comparatively few articles bearing directly on hygiene have appeared in the dental journals since our last meeting. There are, however, several to which I shall direct your attention, as affording food for thought and topics for discussion.

Dr. Geo. H. Gibson, in a paper entitled "Dental Education of the Public," read before the St. Louis Dental Society (*Dental Review*, February 15, 1898), says, "Sometimes I wonder if really the dentists—professional dentists, if you please—are doing all in their power to instruct those who come under their care about even the simple hygiene of the mouth. As dentists we are called doctors, and a doctor is a teacher; and if we are to make dentistry occupy its proper place among the liberal professions we must see to it that the masses have some kind of instruction." Dr. B. Holly Smith, of Baltimore, in a paper entitled "The Stomatologist and His Stomata" (*Items of Interest*, February, 1898), asks the question, "To what extent is the dentist responsible for the hygiene of the oral cavity, and what conscientious and systematic effort is put

forth to improve it?" He further says, "The fact is, that if we expect or hope to take first rank among the professions, prophets and teachers must come from our ranks whose lives and untiring efforts shall be directed to the development of a system of prophylaxis. . . . The patient, enduring toil of the noble army of bacteriologists is constantly encouraged by fruitful evidences of progress; let their number be added to yearly from the cultured young men who are entering our profession, and let us who have no talent for this work at least do what we can to encourage it." Bearing directly on this line of thought, I refer you to a paper by M. V. Ball, M.D., entitled "The Mouth the Via Natura for the Entrance of Disease," read at a meeting of the Odontological Society of Pennsylvania (*International Dental Journal*, November, 1897). Dr. Ball characterizes dental caries as a wound which may serve as a focus of disease, being in constant danger of infection by any of the more dangerous organisms that accidentally find lodgment in the mouth. Among the diseases of microbic origin which thus find entrance to the system he enumerates acute rheumatism (because of its intimate association with endocarditis, often caused by the pneumonia bacteria), meningitis, and local tuberculosis, caries of teeth and pulp destruction, allowing the tubercular bacillus of the streets and the food to gain entrance into the exposed lymph-channels, causing infection of the neighboring glands. He describes decayed teeth as "so many little test tubes of microbe cultures, ready to inoculate the human body whenever and wherever its natural resistance is lowered."

Dr. R. R. Andrews, in his annual address, June, 1897, as Chairman of the Section on Stomatology, American Medical Association (*Dental Cosmos*, July, 1897), said, "It is known that pulmonary diseases are brought about by the 'inspiration' of germs from the oral cavity. The mouth is a veritable breeding place for the infection of the digestive apparatus, Prof. W. D. Miller, of Berlin, estimating, by experimentation with cultures, the number of cultivable bacteria in a very unclean mouth at over a billion. Many of them, he thought, were carried to the stomach at every meal, to be replaced by others developing between meals and over night." Dr. Andrews added, "I doubt if there is a better culture medium to be found for the growth and multiplication of the pathogenic bacteria than the exposed decaying dentin of the human teeth,

after the enamel has been destroyed and the dentin decalcified. In it we have a substance perhaps more favorable for the growth and development of these organisms than any other tissues. This in itself is a very significant fact, of which we should not lose sight while considering this subject. . . . Of all the ills that man is heir to, the most appalling in its dire results is tuberculosis. To-day it is known to be communicated by infection alone, the infecting agent being the bacillus of the disease." Dr. Andrews quoted from Stark, in the "Revue de la Tuberculeuse," on the frequent association between carious teeth and enlarged tuberculous lymph-glands, in the cases cited the anterior glands being enlarged if the incisors were carious, those at the angle of the jaw when the molars were involved, toothache frequently preceding the enlargement of the glands. Stark was of the opinion that he was able to demonstrate that the carious teeth had been the point of entrance of the tubercle bacilli. Dr. Andrews also cites a case within his own knowledge of tuberculosis following an operation upon the cervical glands, concerning which he says "it seems more than probable that this terrible infection was brought about by the organisms of this disease, which were cultured in the decaying dentin of the molar teeth."

C. Flügge (*Journal of the American Medical Association*, November 6, 1897), speaking of the secretions of the mouth and nose, especially in cases of tuberculosis, influenza, diphtheria, etc., found that plates of agar become covered with colonies of bacteria at a distance of several yards from persons speaking loudly and energetically, and emphasizes the danger to be apprehended from the drops of moisture disseminated from infected persons as they speak, sneeze, or cough. He says, "The pyogenic bacteria were frequently found in the mouths of perfectly healthy persons, and decayed teeth are a mine of all sorts of bacteria. These microbes have not been attenuated by drying, but are moist and often extremely virulent."

I desire to direct your attention particularly to this line of thought because of *the criminal indifference*—the words are not too strong—manifested by too many dental operators to the matter of sterilization. The prevalent idea seems to be that if some precaution is observed with regard to broaches and other instruments used in teeth with putrescent pulps, that that is about all that is

necessary,—and even these are too often only wiped off with the same napkin that was used about the mouth; a mere mechanical cleaning from *débris*.

But "figures are stern facts," and when we look into the statistics of infectious diseases in connection with the conditions afforded in the mouth, and especially in teeth with decalcified dentin and putrescent pulps, as breeding places for the germs of these diseases, we can but stand appalled, and wonder that we dare approach the mouth of a fellow human being with any instrument or appliance that has not been thoroughly sterilized by the aid of the most approved methods devised by bacteriological science. Look at the figures for specific infection in the United States, as given by Dr. Frank S. Wright: 70,000,000 population and 5,000,000 syphilitics, —one in every fourteen, with the great majority of the 5,000,000 cases, of course, distributed in the larger cities and towns. The majority of these people, sooner or later, must come under the care of the dentist, and yet how many dentists, practicing in large cities, too, will assure you they have never encountered a case of specific infection in their practice? On what basis do they make this assertion? Is it not because of a lack of education? Because of the difficulty of differential diagnosis? Because the parties are under a physician's care and all external evidence held in abeyance,—the disease in the secondary stage being highly contagious through the saliva, though there may be no oral lesions. How many chancres may not have been passed by as simple ulcers of stomatitis? How many syphilitic tonsils and pharynx as a simple sore throat from a cold? How many mucous patches as herpes or aphthous stomatitis? How many specific lesions of the sides of the tongue or cheek as mere irritation from the jagged edges of broken-down molars? How many ulcers of the tertiary stage as epithelioma or tubercular ulcers?

Diagnosis may be, and undoubtedly is, impossible to the average dentist, but universal sterilization is within the reach of all, and should be the inviolable rule. I hope the discussion of hygiene will take in the subject of sterilization from the dental standpoint.

If all reputable practitioners sterilized their instruments, so that we *dared* educate the public as to the terrible risks they run in allowing non-sterilized instruments to be used in their mouths, what a paralyzing blow their education on this important point

would inflict upon the advertising *Cheap Johns*, who could never take time to sterilize their instruments at the fees they advertise.

A paper entitled "Bacteria of the Mouth," by A. C. Hart, D.D.S., M.D. (San Francisco), was read before the Pacific Dental Congress (*Pacific Stomatological Gazette*, December, 1897). As a preventive of decay, which affords the bacteria a chance of getting in their work, Dr. Hart offers a novel theory,—viz, such treatment, internal and external, as will so harden what he calls the "intercellular cement-substance of the teeth" as to enable them to resist the solvent action of bacteria, a line of treatment which he gives in detail. This includes both systemic treatment, and thoroughly cleaning the teeth and keeping their external surface so smooth that bacteria cannot find lodgment. I have termed this theory *novel*, as heretofore efforts to effect change in tooth-structure have been directed exclusively toward securing increased deposits of calcific salts.

The importance of such hygienic measures as the sterilization of all instruments was illustrated in the discussion of the report of Dr. J. D. Patterson, Chairman of the Committee on Physiology and Etiology of the American Dental Association (*International Dental Journal*, January, 1898). Dr. Patterson in the discussion spoke of a suit for malpractice against a dentist in Kansas, who was mulcted in the sum of $6000, the jury deciding that the hypodermic needle used in anesthetizing the parts was infected, causing the loss of teeth and process. Geo. Winkler, M.D., D.D.S., in a paper entitled "Medicinal Prevention of Dental Decay" (*Southern Dental Journal*, January, 1898,—reprints from the *New York Medical Journal*), discusses the causes of dental decay, which he divides into three classes, the primary cause in a majority of cases being a morbid state of the system, which gives into the mouth vitiated secretions. In the *first class* there is a pathological condition of the mucous glands resulting in the excretion of an acrid corrosive fluid which excoriates the epithelium, involving the gingival borders, and corrodes the teeth, forming cavities around the necks. This is simple dyscrasia, yielding readily to medicinal treatment. The cause of the *second class* of decay is also a morbid state of the system, in which there is a vitiated state of the oral secretions, acid in reaction and lacking the deterrent element which in normal conditions prevents the propagation and activity of bacteria. In this condition of the secretions the teeth are destroyed with various

degrees of rapidity; sometimes an apparent melting away of the entire arch, the decay being characterized by very light brown, chalky, white color and by rapid progress. This condition is also amenable to systemic treatment. The *third class* constitutes that form of decay due not to dyscrasia, but to acid-excreting bacteria which are lodged in sheltering localities about the teeth, their acid secretions dissolving the calcium salts, giving the bacteria an opportunity to burrow into the enamel-tissue or the cement which binds the enamel-rods together, and later on into the dentinal tubuli. In conclusion, Dr. Winkler says, "I am fully persuaded that more than fifty per cent. of dental caries is absolutely preventable by medicines internally administered, which act specifically in the mouth."

In the *Ohio Dental Journal*, January, 1898, you will find a paper entitled "Considerations relating to the Loosening of the Teeth," by Hugh B. Mitchell, D.D.S., in which is discussed the influence of "heredity, *adaptation*, and *use* and *disuse* of *parts* as ever-present factors in the practical problems of hygiene," and especially the relationship of these factors to those degenerative processes which attack the alveolar investments of the teeth.

In the *Dental Register*, October, 1897, is a paper entitled "Relations of the Chemistry and Bacteriology of the Stomach to Dental Caries," by J. H. Kellogg, M.D., who points out the importance of general hygiene, in view of the intimate relations existing between decaying teeth and functional disorders of the stomach.

E. S. Talbot, M.D., D.D.S., read a valuable paper before the Twelfth International Congress, at Moscow, entitled "Oral Hygiene," which may be found in the *Dental Digest*, December, 1897.

The editor of the *Dental News* (November, 1897) points out the importance of a closer study of oral hygiene by the physician, the argument being that with a broader knowledge of oral hygiene many of the diseases common to the alimentary tract could be aborted or lessened in intensity.

Dr. Frank L. Platt read a paper entitled "Necessity for General Education in Dental Prophylaxis" before the Pacific Coast Dental Congress (*Items of Interest*, December, 1897; also *Pacific Stomatological Gazette*, December, 1897).

The necessity for educating the public in the care of the teeth,

and especially as to the dangers resulting from neglected alveolar abscess, is forcibly shown in a paper by G. Lenox Curtis, M.D., entitled "Tumors Resulting from Septic Pulps of Teeth" (*Dental Headlight*, January, 1898).

Dr. O. S. Kerr, of the Missouri State Dental Association (*Dental Digest*, October, 1897), and Dr. Mary Hartzell, of the Minneapolis Dental Society (*Dental Review*, September, 1897), present valuable papers on the importance, from a hygienic point of view, of caring for the deciduous teeth.

Dr. A. H. Brockway (*International Dental Journal*, August, 1897) details quite fully his method of, and wisely emphasizes the importance of, thoroughly cleansing the teeth of patients as an essential preliminary to all other operations.

In a paper entitled "The Drug Habit" (*Dental Review*, January, 1898), read before the Odontological Society, Dr. A. W. Harlan, Chicago, cautions against the excessive use of "washes, lotions, pastes, and powders" for oral cleansing, claiming that the continued use of these things not only blunts the sensibility of the mucous membrane, but also tends to the fixing of a "drug habit" capable of doing a vast amount of injury.

In the matter of personal hygiene, Dr. John L. Wolf, Washington, D. C., in a paper entitled "Hygiene for the Dentist" (*Dental Cosmos*, October, 1897), says that the dentist has no analogy in any other profession. He is obliged to exercise, by turns, much physical strength and endurance, delicate touch, exquisite skill, profound ingenuity, keen judgment, ready decision, great patience, and serenity of temper. To secure all these accomplishments, and to maintain them at their best, the one great prerequisite is the early possession and the continuance of physical health. Dr. Wolf then outlines a plan of hygienic measures in which he reviews the general office arrangements, provision for sunlight and fresh air, the various means of exercise, regulation of meals, and proper diet; the importance of the bath, when indulged in with intelligence, and the incalculable value of an occasional vacation, with complete change of air and scene.

Dr. Frank Platt, editor of the *Pacific Stomatological Gazette* (August, 1897), also points out the great outlay of both physical and mental energy in the daily routine of office practice, and the resulting condition of general weariness, which can only be appre-

ciated by those who have experienced it. He also emphasizes the necessity for occasional rest and change, and a month of vacation every summer.

Geo. J. Monroe, M.D. (*Dental Register*, February, 1898), emphasizes the importance of *pure air* for the proper functioning of the various organs of the body, and the consequent necessity for ventilation in our public buildings, schoolhouses, dwellings, office apartments, etc.

In the *Dental Cosmos*, January, 1898, we find a paper by David W. Wells, M.D., of Boston, entitled "Visual Defects of Dentists," read before the Northeastern Dental Association. Astigmatism appears to be the obtrusively prominent trouble, the percentage of the cases recorded by him being, in connection with near-sight, fifty-four per cent.; with far-sight, thirty-two per cent.; with disturbance of the muscles which move the eyes, forty per cent.; the figures amounting in all to more than one hundred per cent., as some of the cases run into more than one class. Eye-strain results from the effort of the accommodation muscle to overcome the refractive error, with consequent derangement of the nervous system, neuralgias, headache, etc. Dr. Wells calls attention to the position assumed by many dentists in working over a patient, with an oblique poise of the head, a very unnatural position, and peculiarly liable to disturb the binocular balance. We have in this a practical lesson as to the importance of maintaining "an upright position" in our operative work, as has been well set forth by the present occupant of the chair at one of our annual meetings.

The *Items of Interest* has, during the past year, published a series of illustrated articles descriptive of the very elaborate office arrangements of a number of prominent practitioners. From these we learn valuable lessons in the hygienic essentials of ventilation, "fresh air without draughts," "lights without glare," "freedom from noxious fumes and vile odors," etc., though we may not all hope to own and occupy "three-story buildings with fifty-six rooms," or to soothe our patients with the sound of murmuring waters from flowing "fountains, stocked with goldfish and surrounded with growing plants, ferns, and blooming flowers."

Numerous cases of "X ray" burns have been reported during the past year, both in the daily press and in the medical and dental journals. A French writer has collected a record of fifty cases of

injury from this source. The *Pacific Stomatological Gazette*, October, 1897, quotes a case in which Drs. Shields and Jernigan, dentists, of New York, took a radiograph of the jaw of a young woman in the endeavor to ascertain the cause of intense pains in her jaw, making a twenty-minute exposure to the X rays; as a result of which "the hair fell out on one side of the head, and she lost her hearing on that side." The same journal, in the issue of January, 1898, quotes another case from the *Fort Wayne Medical Journal*, reported by Dr. Geo. R. Green, in which sloughing occurred, leaving an ulcerated surface resisting all efforts to effect granulation.

In the *International Dental Journal*, February, 1898, Dr. C. A. Woodward, in the New York Institute of Stomatology, related a case in which an exposure of about ten minutes resulted in very serious inflammation. In the *Journal of the American Medical Association* Frank Boyd, M.D., Paducah, Ky., reports that he was sued for malpractice in the sum of ten thousand dollars for subjecting a patient to the X rays, which produced severe dermatitis. Case put by the court on the same footing as chloroform anesthesia.

Many other instances could be cited. As the use of the Roentgen ray as an aid in diagnosis is becoming quite frequent in dental practice, and appears not to be altogether without risk to the patient, hygiene having been defined as "the science of preventive medicine," I quote the following as possibly offering a preventive measure: "George Apostoli, the noted French physician and surgeon, writes to a brother medico in St. Louis, Mo., that he has discovered the secret of preventing the evil effects which frequently ensue from the application of the X ray. He says that he simply connects the machine with the ground by a metallic circuit. Under that system he has turned the X ray upon hundreds of patients, and not once has there been any deleterious effect from the rays. None of the burning, itching sensations which are commonly experienced have been apparent when the machine used by Dr. Apostoli was in use. According to the noted Frenchman, all that is needed to eliminate the baneful influences of the ray is a connection with the ground in order to complete the circuit."

The following, which I quote from the *Journal of the American Medical Association* (December 4, 1897), has perhaps better grounds

for acceptance: "Dr. C. L. Leonard (Laboratory of Clinical Medicine, University of Pennsylvania) expresses the opinion that burns are not due to the X ray *per se*, but that they are the results of induced electric currents in the tissues of the patients; and mentions as a fact recently made known that a sheet of aluminum, if grounded and placed between the tube and the patient, will prevent the burn while interfering in no way with the X ray phenomena. The induced currents are formed in the aluminum, and carried by the wire to the earth without injury to the patient."

During the past year dental literature has been enriched by the addition of a number of valuable text-books, of which I will refer only to the two companion books, "The American Text-Book of Operative Dentistry," edited by Edward C. Kirk, D.D.S., and the "American Text-Book of Prosthetic Dentistry," edited by Chas. J. Essig, M.D., D.D.S.; and also "A Manual of the Injuries and Surgical Diseases of the Face, Mouth, and Jaws," by John Sayre Marshall, M.D. In these works the importance of oral hygiene is given considerable prominence. The work recently published, entitled "A Treatise on Surgery by American Authors," edited by Roswell Park, M.D., though written primarily for the general practitioner, has much that is of great value to us in our study of hygiene, as it emphasizes especially the importance of the thorough sterilization of instruments; teaching *when* and *how* to sterilize, matters of detail unfortunately receiving but limited attention in Dr. Marshall's otherwise excellent work.

DISCUSSION.

THE CHAIR: It is hardly necessary for me to call your attention, in connection with the paper just read, to the fact that we have had more excellent papers read at this meeting than at any previous meeting that I can recall. This paper is now open to discussion.

DR. A. A. PEARSON: All I have to say is that I don't want to get within range of the X rays, for fear I might lose what little hair I have left. I cannot afford to lose any. (Laughter.)

DR. CHARLES SILL: I recognize in this report a most excellent paper. It is certainly the duty of the profession—and it is in its power to do a great deal—to educate the people in reference to hygiene, and especially oral hygiene. During my practice of over thirty years, whenever a patient presents for attention in the mouth,

if I find evidences of neglect I never fail to direct attention to the fact, and recommend the use of such agents as will lead to its sanitation, and endeavor to lead them to change their habits in this respect. I recall to mind one case that dates back to 1891. A family of my patients sent to me a young lady of some seventeen summers. I found that every tooth was more or less decayed. I told her that it would be useless for me to do anything to them unless she would promise to follow my directions in regard to her mouth and teeth. She promised to do whatever I told her, and she evidently did so, as the results were very satisfactory. Unless patients will promise to follow my directions as to keeping the mouth and teeth clean I send them away, for it would be work thrown away. I tell them how to clean the teeth, and how to keep the mouth healthy. If they don't want to buy tooth-powder, I tell them how they can make it themselves. If their time is limited, I tell them to devote at least the last five minutes before they retire to the care of the mouth and teeth. If that is well done they can get along without any special attention in the morning. If it can only be done once in twenty-four hours, let it be the last thing done at night.

DR. COWARDIN: The subject of dental hygiene has long been one of the greatest interest to me, but the fact is we lack the means of enforcing such rules as would tend to prevent the pathological conditions we meet. Dr. Kellogg, quoted in the paper, strikes the keynote in the paper referred to, but both in medical and in dental practice we are helpless as to enforcing such rules as are laid down by Dr. Kellogg. There is no doubt but that there are certain anemic conditions which lead to loss of the teeth, and we can all see the force of Dr. Kellogg's statements as to the connection between certain conditions of the stomach and decaying teeth. During the period when the teeth are being formed we have no control of the conditions. We seldom see a child until the sixth-year molars (which are usually the first ones to be lost) are giving trouble, when pernicious unhygienic habits have already been formed, infringements of the laws of hygiene which do not come within our province for correction. The dentist should be taught the fundamental principles of the healing art. Put your hand in the hand of the physician who is your personal friend, who visits you at your home, who cares for you when you are sick, and talk

with him of the care that should be given the mothers while the germs of the teeth of the babe are being developed. In that way only can you reach the foundation causes of the conditions which we encounter years after it is too late to prevent them.

DR. J. Y. CRAWFORD: I have always been deeply interested in this subject. I was on this Committee, but I was unable to prepare a contribution to its work; but you can't rule me out of the discussion. I do not want to be egotistical, but I will say that I was the first man to announce the doctrine that medicine ought to include something about oral hygiene. Oral surgery is prophylactic surgery. When I announced that doctrine I could not get one vote then, but we are getting on top now. Some views that have been quoted in the paper must be challenged; for instance, the question of infection as treated by Dr. Ball,—of introducing germs into the lymph-channels through an exposed pulp. It does not follow that because a pulp is infected there may be an invasion of organisms, as of tuberculosis, etc. There are no lymphatics in the pulp to communicate with the lymph-channels beyond the apex. Then, again, if we take into consideration the almost universality of diseased pulps, the diseases quoted would be more universal. Fanaticism is one of the banes of the nineteenth century. I am a temperance man as temperance is taught in the Bible, though I do not believe a man can absorb enough alcohol to burst into blue blazes through a hole in his skull; but there are people who believe that. Dr. Ball is wrong in the impression he has conveyed. I don't want the Southern Dental Association to indorse those ideas. One idea that I want to commend is the authority who was quoted as saying that the sensibility of the mucous membrane becomes blunted through too much medication. That is true; some men seem to have gone crazy on the subject of the hygiene of the mouth. They want a great big brush, so big you can't get it into the mouth without stretching it; and they are not satisfied with simple hygienic care of the oral cavity; they are reaching out in all directions; they even want to treat nasal stenosis.

The best dentifrice is pure limpid water; it is the best ever invented, God Almighty's own prescription. No one knows better than God Almighty (I want that put down) the best dentifrice ever made in the world is pure water, and lots of it; lots of it. What is

the best styptic? Hot water; keep it up and you will surely conquer. Look at the washerwoman's hands, how red and full of blood they are; but lock at them after her day's work in the tub of hot water; note how pale and shriveled and shrunken they are.

DR. CHAPPLE: Do you insist on the use of cold water exclusively?

DR. CRAWFORD: Oh, no; I am not a bigot, but it is the best therapeutic agent in the world. I wish I could make everybody use plenty of pure cold water. You baptize in it, whether by a drop on top of the head or by plunging bodily into it; it is emblematic, pure clean water. It is a great agent in modern medicine, and should be in modern dental surgery, if we would have the benign influence of prophylaxis and immunity from disease. You can cure any kind of disease if you know where to get the remedy. I am a great deal less energetic than I look, and do not expect to live many years longer; but all over this country I have been called a fanatic because I have said, among other things, that modern crown- and bridge-work would lift prosthetic dentistry out of the low rut into which it had fallen. I now say that modern dental surgery will meet the issue along the lines of prophylaxis; that is what dental surgery will be,—prophylaxis.

If I were a young man to-day I would work right along that line. What is the modern idea? To introduce into the system influences that will render it immune. You take a boy who is afflicted with the disease dental caries, proximal, bilateral; let him chew tobacco; you will find the tendency to that disease checked. How does it do it? By the local antiseptic influence of tobacco? By the friction of chewing that tobacco? No; it is by acting as an antidote within the system, checking the progress of the disease, rendering him immune. It is not a local effect, but the quieting influence on the nervous system. I tell you, there is something in that. Take an old man whose teeth are all black from the use of tobacco; you will find no decay; but stop his tobacco and his teeth will soon go to pieces. It is through the anodyne effect on the nervous system.

DR. QUATTLEBAUM: What would be the effect if it were administered internally?

DR. CRAWFORD: I have no doubt but that it would have a beneficial effect.

DR. WALKER was asked to close the discussion. In regard to the instruction of patients at the chair. Among my patients who spend the winter only at Pass Christian is a lady whose mouth I have had in charge for a number of years. The gum between the molars had always given her trouble. When she first came to me she said she had been going to her dentist every two months for treatment; that he had been making injections for the treatment of pockets between the molars in three-quarters of the mouth. She remarked that she hoped I would be able to do more for her than he had accomplished, although he had been very kind and faithful. On examination I found no calculus, no perceptible pus, but simply that, three of the first molars having been lost some years previous, the second molars had moved forward, and the food packed down between the teeth gradually more and more, forcing the gum away by mechanical pressure. The tissues seemed to have become accustomed to the gradual and constant accumulation of impacted food, until the patient was actually not conscious of its presence. As I found the same condition existing every time she returned, I finally said to her, "I will be perhaps unpleasantly frank with you in telling you the cause of your trouble. It is simply due to food packed down between those teeth, the presence of which I think you are not aware of." I then removed the impacted food, as I had, of course, done at her previous visits, but this time I showed it to the patient. She was absolutely astonished and thanked me warmly, saying she would endeavor to prevent it now that she knew of it. The pockets were due to the mechanical action of the impacted food, while the inflammation was probably to some extent due to fermentation also. Her previous dentist in Detroit had repeated the injection of the pockets without pointing out the cause of the trouble. While she said her former dentist was kind, she now thinks that I was kinder in telling her how to avoid the cause of the trouble, thus obviating the necessity for continually-repeated treatment. I have better success in getting certain patients to take care of their teeth if I can get them to sit down comfortably when they brush the teeth, as they will then take more time for it. Some people, from lack of sufficient energy, or from an aversion to standing up long, will not take sufficient time to clean the teeth thoroughly. In other cases, when they are of the nervous temperament, they will take more time if you can get

them quietly seated. Such people are inclined to rush through their tooth-cleansing as they rush through with everything else, while brushing the teeth should be a deliberate, systematic process. They sometimes think I am joking when I tell them to sit down to it, but when I get them to understand the importance of the work it is a great point gained. In regard to the remark of my friend on the left (Dr. Crawford) as to infection through the pulp-chamber, while I do not doubt that the pulp is without lymphatics (although Bödecker does picture them very beautifully), I fail to see why, with disorganized, putrescent pulp-tissue occupying the canals, bacteria may not penetrate through the apical foramen and reach the lymph-channels in the jaw. As to the position that open pulp-canals are of so much more frequent occurrence than specific infection, statistics given by medical authorities show that in the United States one in fourteen is, or has been, capable of communicating specific infection. Of course, the proportion is less in the country and greater in cities, and I certainly do think that the proportion of patients who have open pulp-canals is much less than one in fourteen. The better class of people don't go around with open pulp-canals. It is also stated that one in every seven deaths is due to some form of tuberculosis, and I really do not see why disease germs might not be introduced into the system through pulp-canals and the gums, especially in anemic people. I am sorry to introduce Dr. Bonwill's name, as I have had occasion to refer to him so frequently on previous occasions, but his *little brush* is as much of an extreme as the *great big brush* described by our friend from Tennessee. I think the S. S. White No. 213 has a more uniform quality of bristles than the prophylactic, together with many of the good features of the latter. When I find that my patients do not succeed in getting their teeth clean, notwithstanding the instructions I have given, I sometimes ask them to bring me their brush, and not infrequently find that they are trying to use a brush large enough for a cow; but we can greatly improve some brushes by shortening the bristles from the heel to the toe of the brush, which can be done with a pair of sharp curved scissors. When the bristles are too long, the brush strikes the ramus and wounds the tissues. I recommend a small stiff brush, but the patient should gradually accustom the gum to a stiffer brush. Of course, whatever brush is used, it should be in such a direction as

will brush the gums onto the teeth; and cross-brushing should be especially avoided in using a stiff brush. Dr. Crawford's idea of using pure water as a dentifrice is not a bad one if sufficient friction is given with the brush—elbow-grease he termed it. I can show my own teeth as an example of what can be done with pure water alone, for as a rule that is all I use myself, with occasionally a little chalk and perhaps, for the pleasant flavor, one of the numerous antiseptic preparations on the market, such as listerine, sanitol, borolyptol, or pasteurine, giving preference to the latter on account of its very decided germicidal action, due largely to the three-tenths per cent. formaldehyd which it contains. These I use, however, more especially to sterilize the tooth-brush than as necessary for the teeth themselves when the mouth is in a healthy condition. All of these things, like Phillips's milk of magnesia, are good when indicated, and should only be prescribed for certain conditions. In a perfectly healthy mouth I believe that the efficient use of a good, properly shaped, stiff brush and pure water is all that is necessary.

DR. QUATTLEBAUM: Why do you advise a stiff brush?

DR. WALKER: Because soft bristles flatten down on the surface of the teeth, while stiff bristles, not too close together, go in between the teeth where their action is needed. And you want friction of the gums also, brushing the gums onto the teeth; the lower ones up, and the upper ones down, but never crosswise. You want to draw the festoons down between the teeth. Brushing crosswise tears the gums, injuring the festoons.

DR. COWARDIN: Do you advise the use of milk of magnesia continuously?

DR. WALKER: No; only when special conditions indicate it. I direct the use of litmus paper by the patient, and when the secretions are acid I say use the milk of magnesia. It appears to be more beneficial, used at night, than either soda or lime-water.

DR. COWARDIN: One fact that has not been mentioned is that the use of alkaline applications to neutralize the acid of the glandular secretions causes a perversion of the function of the glands, and is hence dangerous except for a temporary effect.

DR. WALKER: As I have said, I do not prescribe its use continuously, but only in case of such conditions of the secretions as are proving injurious to the teeth.

DR. COWARDIN: Such treatment should be instituted as will correct the perverted secretions. Thus the results will be apparent in the mouth.

DR. WALKER: I quite agree on that point, and it is for that reason that the dentist should have more of a general medical education, that he may be enabled to get at bottom facts. But we are obliged to avail ourselves of temporary expedients.

DR. QUATTLEBAUM: This subject is of such practical interest that I move that when it gives way to the special order of business next on the program it be passed only *pro tem.*

DR. WALKER: Hygiene can very appropriately be discussed subsequent to Dr. Fort's demonstration in bacteriology.

DR. W. K. FORT: The subject of my work bears directly along the line of hygiene.

Bacteriology and Oral Hygiene.

Paper by Dr. A. K. FORT, Atlanta, Ga.

THE study of bacteriology, from a dental standpoint, offers a broad and fruitful field for study and experimental investigation. It should be a matter of reproach to the profession that we do not know more of the low organisms to whose action we owe our existence as dentists. We have begun at the wrong end in our treatment of dental lesions. Instead of striking at the cause, we simply endeavor, by mechanical means, to repair lost tissue; but we may reach perfection in the art of replacing lost tissue, and still be failures, unless we can add something toward the prevention of this loss. Why should we not battle against the causal factors of caries as the sanitarian battles against the causes of the specific infective diseases?

I should hesitate to call the attention of the Association to this subject if a review of the proceedings of dental meetings for years past did not fail to show that it has been sadly neglected. Why should not the "ounce of prevention" adage apply to our specialty as well as to others? Why is it that the specific infective diseases have decreased within the past twenty-five years? It is due to a better understanding of the causes of these diseases. Years of patient study and investigation have enabled the medical profession to cope successfully with the most virulent diseases. Why? Because the causes are understood, and prophylactic treatment thereby becomes possible. Why is it that the most universal disease of mankind continues to increase instead of diminish? Is it due to our inability to cope with questions of this kind, or to the preponderance of the commercial spirit in practice? Surely not the former! Pages and pages of our magazines are covered with advertisements of apparatus for filling teeth, while seldom do we

see anything pertaining to the prophylactic treatment of caries. As a young member of the profession, I protest that this is wrong. The most disappointing thing in my experience was, on entering what I conceived to be a noble, scientific profession, to find the scientific and ethical comparatively unknown quantities among us. Since the days of Leeuwenhoek what have we done toward investigating the mouth bacteria? With a few notable exceptions, such as Miller, Black, and Williams, we have accomplished nothing in this line. Shame to the dental profession that this is so! We are constantly observing the teeth of school children going to pieces for want of proper care, and what do we do? Simply introduce some cement fillings and instruct the patient to call again in three or six months, instead of demanding in a voice of thunder that oral hygiene be taught in our schools. It would seem that we are afraid of depriving ourselves of a means of subsistence. Shame to the practitioner who loves for a mouth full of carious teeth to present in order that he may coin dollars, with never a thought of how to prevent such conditions!

And if we ever succeed in the prevention of caries, it will be due to bacteriological investigation. Why, then, do we not devote more time to this subject?

Pertinent questions, these, and I leave them for your consideration.

The study of bacteriology has revolutionized medicine, but it has scarcely produced a ripple of excitement in the dental profession. How can we hope to successfully cope with a diseased condition unless we thoroughly understand its causal factor? Let us then devote more time to this most interesting and instructive subject.

The first experiment herewith supplied illustrates the folly of using infected broaches in root-canals. Many of us have had to contend with abscesses following operations of this kind. In fact, dead teeth are the most trying things we have to contend with. A glance at the experiment will explain why. The logical method of treatment suggests itself.

What would we think of a surgeon who would remove the appendix with an instrument not sterilized? Yet perhaps every one of us has penetrated the apical foramen of a tooth with a non-sterile broach. No wonder that dead teeth and septic pulps are the

bane of our existence when such exceptional opportunity is offered us to push millions of bacteria through the apical foramen. It is a sad fact that many of us never fail to take advantage of such an opportunity, thereby causing sleepless nights and loss of confidence on the part of the patient and final resort to trephining and forceps on the operator's side. The injunction of the dentist to the patient, "Do not take cold in this tooth," after the apical space has been crowded with bacteria, will not even serve the charlatan longer.

The day of aseptic dentistry is due, but, unfortunately, it is not here with a great many of us. Asepsis is, in my opinion, as important for the dentist as for the general surgeon. Why should we not be as careful with our instruments as the surgeon? And yet we are not. Pus cannot ordinarily be formed without the aid of bacteria; therefore, if we do not force bacteria through the apical foramen in the treatment of dead teeth, we will not have any abscesses to deal with, provided, of course, that the bacteria have not already penetrated before treatment begins. The exceedingly great resistance of the gum-tissue to the action of bacteria is not found in the tissues at the root of a tooth. This explains how we may wound the gum with an infected instrument with impunity, while the same instrument, passed through the apical foramen, produces an abscess. This immunity of the gum-tissue naturally makes us careless with our instruments, and many an abscess can be traced to this cause. One of two things must go,—abscesses following operations in root-canals or our reputations as dentists. Which shall it be? The question is with you.

Bacteriological investigation has taught us what little we know of antiseptic treatment, but it is also true that investigations of this kind have been left almost entirely to the medical profession. We need more Millers, Blacks, and Williamses among us. Let us wake up and do something to discourage the term of "tooth carpenter."

Dental bacteriology enables us to make original investigations at trifling expense, and we are derelict in our duty to mankind if we do not do something to contribute toward the universal appreciation of oral hygiene.

The human mouth was the incubator of the first bacteria ever observed by Leeuwenhoek over two hundred years ago, and yet

we do not know much more about the oral bacteria than he did. This is our fault, not his.

I appeal for more thought and investigation on this subject, feeling confident that the greatest triumph of Dentistry, if we achieve a triumph at all, will be in the prophylactic and not the restorative method.

[At the conclusion of the reading Dr. Fort exhibited and described an interesting collection of culture tubes, showing very conclusively the necessity for sterilizing dental instruments. In each of the first pair of tubes shown was seen suspended in the bouillon a tooth which had been thoroughly cleansed and made aseptic, but immediately before stopping the tube with cotton a septic broach was passed through the root-canal of one, an aseptic broach through the other. The very free growth of pyogenic microbes in the former tube illustrated a frequent source of alveolar abscess, the contents of the other tube remaining unchanged.

Another comparative exhibit was that of two perfectly sterilized plates covered with a transparent film of culture medium. Across one was drawn a septic broach, across the other an aseptic broach, the former showing a growth of bacteria following the line traced by the broach. The latter showed no change. Numerous tubes inoculated with human saliva and with carious dentin (both natural and artificial decay) were shown as a comparative test of various germicidal drugs and filling-materials. This exhibit was made informally, and the discussion became conversational, as those interested gathered around the exhibit stand.]

DISCUSSION.

DR. COWARDIN: This demonstration opens the subject of hygiene again, as it shows the great importance of oral hygiene and the necessity of hygienic precautions in our operations. The question before us is, What practical use can we make of the facts demonstrated to us? How can we make it of practical value? We have seen that certain agents exert a definite influence in preventing the growth of bacteria. What does that mean to us? As I understand it, the lesson intended is that we are to use these agents (with most of which we are familiar already) to prevent the growth of bacteria in the mouth. This reminds me of the story

about Mr. Davis's cow, which was very sick, and to which a great variety of medicines was administered. The man in charge of the cow reported that she got well of the disease, but died of the medicines. In the paper on hygiene to which we have listened, an eminent authority was quoted as saying that the continued use of strong antiseptics in mouth-washes, etc., would result in an irreparable modification of the oral tissues. I would not have it understood that I undervalue the importance of bacteriology, but as the All-wise Creator created us we were not subject to disease. Disease is the result of sin; it is the result of our shortcomings, of our violations of the laws of God. In an attack upon the enemy we must carry our ammunition. Let us use our knowledge of bacteriology as a weapon in fighting the enemy, but let us be careful that in the use of our ammunition we do not destroy what the enemy might have left unharmed. Let us guard against results that may be worse than the evil we are fighting against.

DR. B. HOLLY SMITH: This reminds me of the story of a little fellow who was vainly endeavoring to reach up to a door-bell. A dignified bishop of the church was passing by, and, seeing the dilemma of the little tot, in the kindness of his heart offered to ring the bell for him. He had no sooner done so than the little fellow darted away, saying, "Now, we must run like the devil!" Is it not possible that in our efforts to develop something practical from this interesting demonstration we might get ourselves into danger? The experiments were very interesting, and are fruitful of suggestions that might be turned to practical account. The tube containing the tooth through which an infected broach had been passed illustrates very emphatically the importance of sterilizing the broaches that have been used in the treatment of pulp-canals. Do we practice this? I am afraid of getting into deep water, and am not prepared to discuss this exhibit from a scientific standpoint, as I have not followed up this line of work. But it is very clear from even a superficial study of these growths that it is very important that we should guard against contaminating our patients by carrying disease-germs from one mouth to another. Our instruments can be very thoroughly sterilized by exposing them from seven to fifteen minutes to the vapor of formol. A convenient apparatus for this purpose is a copper box to hold the instruments, broaches, etc., with a lamp beneath it, over which a

tablet of formol is placed. The instruments should, of course, be mechanically cleansed of all *débris* before exposure to the vapor. This is a new thing, and I will be very glad to give a more complete description (by letter) to any one who is interested in it.

DR. COWARDIN: I would like to ask Dr. Smith if in speaking of carrying disease from one mouth to another he had reference to the microbe of caries?

DR. SMITH: I live with one grand hope, though I am almost afraid to state it; but it has been foreshadowed by Dr. Black that we may yet attain to immunity from caries; that deterrent influences will yet be discovered which may be applied to individual patients.

DR. COWARDIN: My question had reference to the possibility of carrying from mouth to mouth the germs which cause caries.

DR. SMITH: There is an element of absurdity in the question.

DR. COWARDIN: I do not wish to measure words nor to raise the point of common sense, but if it is admitted that bacteria are the cause of decay, why may they not be carried from mouth to mouth by means of infected instruments, as it has been shown that abscesses may be caused by an infected broach?

DR. G. F. S. WRIGHT: It is the province of the investigator not merely to give out a theory, but also the means of demonstrating it and of satisfying both himself and others.

DR. W. E. WALKER: I wish to call your attention to a little point, a practical one; that is, a thoroughly aseptic cover for the operating table,—the bracket table,—a cover which is to be removed with the instruments used for each patient, to be sterilized with them. It is simply a sheet of rubber-dam of suitable size, which can be purchased in any drug store. It can be boiled an indefinite number of times without injury, and obviates the great danger of contamination from laying instruments down on a felt, velvet, or linen cover. The color is agreeable and does not reflect the light; it does not absorb the warmth from steel instruments, as is the case with a marble or glass top; it does not injure the nickel plating of your instruments; it is noiseless as you lay down the instruments; it is not injured by acids as are linen or felt covers; in short, it is free from every objection that can be offered. It can be kept thoroughly aseptic by boiling for five minutes in the same water in which the instruments are boiled, to which should be

added a spoonful of carbonate of soda. The little piece which I show you has a record of having been boiled thirty-two times for five minutes at a time. Once, when it was forgotten, it was boiled half an hour, and yet, as you see, it is quite as elastic and as strong as a fresh piece of rubber-dam. I will ask Dr. Fort what method he employs for sterilizing his instruments.

DR. FORT: I am not a practicing dentist, but I will say that dry heat is undoubtedly the simplest and the quickest means. Boiling will sterilize, but it requires half an hour; the spores of some bacteria are very resistant.

DR. WALKER: I think Dr. Fort is a little in error in stating that the spores of any bacteria will resist boiling water for half an hour, and especially of those found in the mouth.

DR. FORT: Some of the bacteria found in carious dentin will resist boiling in water for half an hour. In fact, there are numerous organisms that will survive this.

DR. WALKER: What is the effect upon anthrax spores?

DR. FORT: Boiling for half an hour will not always destroy them.

DR. WALKER: What effect has the addition of carbonate of soda to the water?

DR. FORT: Soda is a germicide in itself. But for absolute security steam heat is essential.

DR. WALKER: Soda is added to the water not only for its antiseptic, digestive, and anti-rust qualities, but also because it raises the boiling point of the water, in that way also increasing its efficacy as a germicide.

DR. FORT: Do you consider boiling or moist heat superior to dry heat?

DR. WALKER: Roswell Park, an eminent surgeon who is authority on these points, and who in his recent work gives especial attention to the subject of sterilization, states that anthrax spores, which are the most resistant, are killed in two minutes in boiling water to which carbonate of soda has been added. In Hare's "System of Therapeutics" the thermic death point of anthrax spores is placed at 100° C. (212° F.), four minutes' boiling. According to Sternberg, certain non-pathogenic spores will resist the temperature of boiling water for hours, but the spores of the pathogenic bacteria are destroyed at the boiling point of water in

a few minutes. Roswell Park says two minutes in boiling soda water, fifteen minutes in steam, and three hours in dry heat. He further states that while it has been supposed that steam under pressure would have greater germicidal powers, it has been proven inferior, as it then becomes dry heat, which although having a higher temperature is really less efficient because less penetrating. Of course steam is rendered more efficient by superheating, provided it is kept under great pressure, sufficient to keep it moist. I therefore use in my practice boiling water to which soda has been added, and can recommend it to those who have been using other methods. As a temporary device, a very simple, inexpensive, convenient apparatus consists of a large, flat-bottomed, agate-iron pot with a cover and a "cream cheese mold," a tin vessel with perforated bottom and sides. The instruments are placed in the tin vessel and sunk in the boiling soda water for five minutes. My rubber-dam bracket table cover is also boiled in the same water with the instruments used for each patient. This can be carried out even with hand-pieces and automatic pluggers, shaking the water from them as thoroughly as possible after boiling and then laying them in a dish of alcohol for twenty minutes. This not only prevents rusting, but cleanses them so perfectly from all gumminess that after oiling they are in most excellent condition. After this treatment I am able to hear the distinct click of each step of the machinery of my automatic hand-piece, more distinctly than ever before. My mouth-mirrors I lay in a hydronaphthol solution.

DR. FORT: My experience in boiling instruments has been that neither two, four, nor thirty minutes' boiling will sterilize them, as proved by inoculating a plate of agar. According to my experience in making these cultures, spores that resist boiling two, four, ten, or even thirty minutes are perfectly sterilized under steam pressure.

THE CHAIR: Have you ever succeeded in making cultures from instruments that have been sterilized under steam pressure?

DR. FORT: No, sir; I have not. I may be mistaken in my conclusions, but that is the result of my experiments.

DR. QUATTLEBAUM: I think all this implies a great deal of unnecessary trouble about our instruments. I do not believe there is any danger of infection from the instruments used in the teeth.

The soft tissues are always protected by napkins or the rubber-dam; the instruments are used dry, and I cannot believe that with ordinary cleanliness—the use of soap and water—there is any danger of infection from our gold pluggers, automatic mallets, etc. Of course it is different with broaches or lancets, but I do not believe that absolute sterilization is necessary for anything but the instruments that are used in cutting. It is not necessary to sterilize instruments that never touch the soft tissues. I do not believe that the handles of our instruments are very extensively exposed to bacteria.

DR. G. W. WELD: One point that has not been brought out: In the bacteriological laboratories, where absolute sterilization is essential, not only for instruments, but also for the nutrient media, everything is sterilized three times, fifteen minutes at a time, for three successive days. One boiling will kill all the bacilli, but unless the boiling is repeated at intervals spores will hatch out. It was the failure to reboil that sustained the theory of spontaneous generation until the results of repeated boiling upset that theory.

DR. B. HOLLY SMITH: We need a simple, practical method of sterilizing all instruments, for notwithstanding what has been said to the contrary absolute sterilization is necessary, for we have to deal with patients as they come to us, and any instrument which is used in the mouth is liable to carry disease into uninfected territory. A twenty-five per cent. alcoholic solution of hydronaphthol is valuable. I lack confidence in the aqueous solutions which only contain three per cent. hydronaphthol. Formaldehyd—the forty per cent. as we purchase it—is also reliable. If every broach that we use is passed through the fire and then dropped in formaldehyd, we will avoid carrying contagion from one mouth to another. Unless we take these precautions we cannot hold ourselves blameless. "Soap and water" is not by any means sufficient.

DR. A. A. PEARSON: How do you sterilize your hands?

DR. SMITH: If I am working for a syphilitic patient I use gloves, lisle thread gloves, reserved for use with certain patients only, and which are subsequently boiled indefinitely. Permaganate of potash, followed by oxalic acid to remove the stain, is the best sterilizer for the hands.

DR. L. G. NOEL: We need more light on the subject of dental

prophylaxis, the prevention of caries of the teeth; also what is the best as an antiseptic mouth-wash. You say we must sterilize our instruments so as not to convey infection from one mouth to another, but what we want especially is light upon the prophylactic management of the mouth. Shall we use sanitol, listerine, pasteurine? What shall we use in the mouths of children? Of the many preparations that are offered for our use we want to know what is the best. I believe that in the case of tobacco-users the nicotine destroys the pyogenic germs that are concerned in the production of caries, but we want something that we can recommend to all.

DR. CRAWFORD: What we want to know first of all is the etiology of the disease. No one would be more happy or more thankful than I if the question could be answered along this line. We ought to divide up and investigate in different directions until we reach something definite. Dr. Noel asks about the best prophylactic measures—how to keep the mouth healthy and clean. (DR. NOEL: I said *sterilized*.) Nothing better than elbow-grease, common sense, and cold water. Patients often ask me, What shall I use to clean my teeth with? I tell them, You can do it with cold water, and it is as good a thing as you can think of. One says, tell them to sit down to it; another says he works with gloves on for fear of infection; but I want my sleeves rolled up to do thorough work. I am opposed to the idea that there is any such danger as that referred to by Dr. Smith, though perhaps the difference of locality has something to do with it; but I believe I examined about as many mouths as any one here, and though I do not pretend to say such a case can never occur, yet the oral cavity has great comparative immunity from those types of infection.

DR. WRIGHT: Is not that because of the excretory functions of the mouth, such a constant pouring out of fluids?

DR. CRAWFORD: That is perhaps one factor in the comparative immunity of the mouth. I believe in the efficacy of cold water. You may take one hundred patients, getting them as much alike as possible in oral conditions, divide them into four classes; give Dr. Noel one set, give Mr. President another, give Dr. Smith another; I will take the fourth. You may all use what you choose for sterilizing and cleansing, etc. I will use nothing but cold water, and I guarantee that the mouths of my twenty-five will be

in as good condition as any of the others. My word for it, with all your favorite processes of medicating and sterilizing, cold water, used patiently and faithfully, is the best thing yet. I am much obliged to Dr. Walker for his ingenious suggestion of the rubber-dam spread. I will use that, but I'll stick to cold water.

DR. B. HOLLY SMITH: This reminds me of the country debating society where the question was argued, Which gives the most light, the sun or the moon? One argued in favor of the sun; the other replied, "Yes, Mr. President, but you forget that the sun only shines in daylight; the moon gives you light at night!" Our arguments are almost as absurd. I am very fond of Dr. Crawford's volubility,—his grand rolling oratory and eloquence. When Crawford is not here we have no camp-meeting sky-rockets! But he must be sure that he is correct in his premises; he must mind his stops, or he will find himself in the predicament of the preacher, who, being handed this notice to read from the pulpit,—"Captain Smith has gone to sea; his wife asks the prayers of the congregation,"—read it, "Captain Smith has gone to see his wife; asks the prayers of the congregation!" Or like the diner-out who was given a written toast to propose,—"Woman; without her, man is a savage,"—read it, "Woman without her man is a savage." Does Dr. Crawford clean the teeth of his patients, remove green-stain, calculus, etc., with elbow-grease and cold water? I can furnish all the elbow-grease necessary, and if that is the best way I want to know it. Any effort whatever is better than no effort at all to dislodge and disturb and diminish the numbers of the mischievous microbes of which we are told that five million can stand in a row across the head of a pin, and that a single pair, if left undisturbed to propagate, would in time displace the waters of the ocean. As to antiseptic mouth-washes, shall we say to the manufacturing dentists who are seeking to aid us, all those things are unnecessary! All we need is pure water? But I draw the line at elbow-grease.

THE CHAIR: Dr. Walker has the privilege of the floor to close the discussion.

DR. WALKER: The gentleman from South Carolina spoke of the sterilization of our pluggers, etc., as being entirely unnecessary. I would ask him what means he would use to prevent the infection of instrument handles, etc.

DR. QUATTLEBAUM: Sterilize the hands by washing them. There is no necessity for putting the handles of your instruments into the patient's mouth.

DR. WALKER: But in putting on the rubber-dam do you not get saliva on your fingers? Do you wash your hands every few moments?

DR. QUATTLEBAUM: No; it is not necessary.

DR. WALKER: But when you get the patient's saliva, and perhaps germs of various kinds, on your hands, and thence on your instrument handles, is it not necessary to sterilize them?

DR. QUATTLEBAUM: Not if there is no abrasion of the mouth. There is no danger of infection from merely touching the lips if there is no abrasion. If you are cutting in a cavity extending below the gum, then you must be careful to have your instruments aseptic. But if you are working in the hard tissues of the tooth, and there is no abrasion of the mucous membrane, there is no necessity for any special precaution.

DR. WALKER: But suppose you are working for a patient with specific infection; what do you do about your plugger handles?

DR. QUATTLEBAUM: In such a case I should of course be very particular, but I do not remember ever having had such a case.

DR. WALKER: Is that probable, when statistics prove that one person in every fourteen has or has had specific infection? Dr. Holly Smith says we can diagnose it and then put on gloves and send them *with the instruments* to the laundry! But if we, as dentists, can always diagnose it, we are away ahead of the physicians and general surgeons. Persons so affected go to physicians, who keep down the symptoms so that no one ever knows of it, not even the patient himself in many cases. The physician does not tell the patient all he knows. And so the dentist cannot always know it, and for that very reason the greatest precaution is all the more necessary. It appears to me that there is an additional element of danger in the use of kid gloves in that they retain the noxious germs in continued contact with the fingers.

DR. QUATTLEBAUM: Then if you cannot disinfect the hands I do not see the use of taking so much trouble with the instruments.

DR. WALKER: That is the very point I wish to make. Keep the hands bare and wipe them frequently. We know that even steel instruments can be sterilized by sufficiently energetic friction. As

to sterilizing the hands with permanganate of potash, followed by oxalic acid, as recommended, that takes a good deal of time, and as time is often quite an important element, I have adopted the following time-saving method: Digest a good article of toilet soap in water, having it shaved fine and placed in a mortar, using the pestle on it, adding a little water at a time so as to make a jelly, when you will soon find that you have more than twice the original bulk. With a very little of this you can cover the hands with a lather before you could rub any off the cake of soap. Add a little flour of mustard to the lather and rub the hands together. It makes almost instantaneously a nice yellow lather, which is easily rinsed off, leaving a faint odor not at all unpleasant, making the hands feel delightfully clean, and giving the satisfaction of knowing that they are perfectly sterilized. Roswell Park found the oil of mustard is second only to bichlorid of mercury as a germicide. Of course we cannot use the oil of mustard on our hands, but he recommends its use in the manner I have described, and uses it himself constantly in his clinic. In regard to the spores which are so resistant as to have seemed for awhile to have proved the theory of spontaneous generation, we were not told of what variety they were, but they may not have been the pathogenic germs found in the mouth. I wish to make it emphatic that it behooves us to sterilize every instrument. There are many diseases which it is possible for us to convey from one patient to another by means of our instruments,—tuberculosis, if the patient is susceptible, or diphtheria, to say nothing of syphilis, which we cannot always diagnose. We have no right to risk conveying infection by our instruments from one patient to another when we know the danger and that preventive means are at our command.

DR. FORT: Anything that I have said I am prepared to substantiate in the laboratory. If Dr. Crawford can accomplish what he claims with cold water, very good; but practically it is impossible to sterilize with cold water. The main object of these investigations is to get at the best practical methods of sterilization. We have not got it yet, but I hope we will get it for root-canals as well as for instruments.

Dental Hygiene.

PAPER BY DR. J. W. DAVID, MEXIA, TEXAS.

IN dental hygiene we possess a very potent prophylactic means. Recent developments in the bacteriology of the teeth impress the dental mind with the importance of cleanliness as a prophylactic measure.

"Painless dentistry" by cataphoresis is brilliant, and appeals to the practitioner as most useful; yet clean teeth and healthy gums would be the means of greatest good to the greatest number, and secure a condition of the teeth which would not cry so loudly for electro-cocainization. The bacteriology of the mouth and teeth has been forcibly demonstrated by Professor Miller, of Berlin, who has isolated from the mouth alone more than one hundred different kinds of bacteria. From the dentin six species have been isolated by Galippe and Vignal.

The enamel of the teeth, being composed of calcium phosphate, fluorid and carbonate of magnesium, together with animal matter, is readily destroyed by the acids of fermentation and attrition of the teeth. The enamel being thus destroyed, the dentin is exposed to the action of bacteria.

It has been demonstrated that caries of the dentin is due either directly to micro-organisms or to the lactic acid produced by the bacteria in contact with the food.

The infectious process in the superficial layers of the dentin is directly caused by the Bacillus dentalis viridans. Through this carious dentin the Bacillus pulpæ pyogenes makes its way to the pulp-cavity. And thus the pulp-chamber is open for pathogenic germs to make their way to the pulp-canal.

It is believed, though not demonstrated, that infection of the pulp-cavity may take place through the blood-vessels, since a layer

of hard dentin does not protect the pulp from infection with certainty. Many of the bacilli found in the diseased pulp are non-pathogenic, as is the case in other tissues of the body.

As factors in the production of pyorrhea alveolaris, not only do we have a systemic condition of the uric acid diathesis and mercurial ptyalism, etc., but also the mechanical irritation of calculus, which is composed principally of calcium carbonate. The irritated gums being attacked by the Bacillus gingivæ pyogenes, we have pus resulting.

The microscope has made clear the cause of tooth decay, and shown that it is due to micro-organisms acting in favorable local media rather than to a constitutional condition, which, while it may have its bearing, is a secondary cause to the local condition of the mouth.

By maintaining a clean, healthy condition of the mouth and teeth the dentist becomes a co-laborer with the physician in preventing diseases of the alimentary canal, since a hygienic condition of the mouth is essential to the healthy secretion of the digestive ferment, so important in the first step of alimentation for sustaining health and strength of the entire body.

"Neglected teeth are like so many little test tubes of microbe culture, ready to inoculate the human body whenever and wherever its natural resistance is lowered."

Recognizing the fact that bacteria of a disease-producing nature are constantly present in the mouth, it is easy to understand that when the soft tissues of the mouth are injured, or when the teeth are in a decaying condition, systemic infection readily occurs. Thus the eruption of the teeth in infancy is very often accompanied by severe general disturbance, as meningitis, pneumonia, convulsions, diarrhea, and simple fever.

There are a number of diseases of the mouth, as stomatitis, thrush, glandular enlargement of the tonsils and lymphatics, dependent on disease germs, for which carious dentin serves as a nidus.

Open wounds produced by lancing gums or extracting teeth, or accidental wounds from whatever cause, are open to the worst kind of infection in an unhygienic mouth.

How best to establish and maintain this hygienic condition is of much concern to the dentist.

The fact that this condition must be established is recognized when we remember that no patient comes under our observation with clean mouth and teeth.

Theoretically, an aseptic condition of the mouth should obtain before work on a decayed tooth is begun, just as the field for any surgical procedure should be rendered aseptic.

Since this, in many instances, is impracticable, as the patient demands that the tooth be filled at the first sitting, it becomes the dentist's duty to thoroughly clean the teeth, and give the patient minute detail of how to maintain this cleanly condition.

Extreme care must be had in removing tartar; in truth, more care is necessary in this procedure than is commonly given by the dentist. It is essential that every particle of foreign matter be removed, and this with as little injury to the gums as possible.

After thus removing tartar, if pus be present, treat the gums once a week by thorough application of trichloracetic acid, followed by a daily use of an antiseptic wash, such as the following, which has proven very efficient in the hands of the writer:

℞—Tr. iodin, m. xlv;
Carbolic acid, m. vi;
Tannic acid, gr. i;
Glycerin, ℥i;
Aq. dest., q.s. ad. ℥v.

On the other hand, if the case be not so far advanced, no tartar or pus being present, carefully instruct the patient in the use of the tooth-brush three times daily. The "prophylactic" brush we would recommend as best adapted for reaching all the surfaces, and, too, the molars can be readily reached with this form of brush.

Then passing dental floss between the teeth, and the occasional use of a harmless dentifrice, keeps the mouth and teeth clean.

The so-called harmless dentifrices are not nearly so reliable as *pure soap and water,* which, after using, leaves no deposit; and in the use of soap and water there is no injury done the tooth-surface.

Hygiene.

PAPER BY S. W. FOSTER, D.D.S., ATLANTA, GA.

WE understand hygiene to be defined as that branch of science which has for its consideration the preservation of health. This, of course, includes in its broad sense the study of all conditions relative to the development, growth, and preservation of the individual.

Hence we have a twofold aspect presenting itself; first (and by far the most important feature) is the prevention of disease, and second the removal of the cause thereof. While this is applicable to disease in general, the question as it presents itself as of greatest interest to the dentist is oral hygiene. While I have nothing new to present on this subject, it involves the principles which fill our life-work; hence it should at all times command our attention and thought.

As regards preventive hygiene of the oral cavity, this begins with embryonic development. Indeed, the most important period of life, from a dental standpoint, embraces fetal life. It is during this time that the dental follicle is formed and the tooth-structure is being developed; and, since we know that the teeth which decay most frequently are those that are imperfectly developed, we justly conclude that every influence which favors the complete development of the dental organs is of the greatest importance from a hygienic point of observation. Then our first and most important consideration is directed to the nutritive supply. This is the more imperative since we know the teeth to be perfect organs, and have not the power of undergoing repair. If we wish to physically develop the teeth, as well as other organs, we must depend more upon the quality than the quantity of nutrition. We note in some of our text-books that one thousand pounds of whole wheat grain contains one hundred and fifty-six pounds of muscular matter, twenty-five pounds of fat, and one hundred and seventy pounds of

bone matter. One thousand pounds of fine flour shows only one hundred and thirty pounds of muscle, twenty of fat, and sixty of bone principle; thus we find about three times as much tooth-forming material in the full grain than in the fine flour. It is also shown that one thousand pounds of wheat bran contains about seven hundred pounds of bone material; ordinary superfine flour contains only about thirty pounds of bone-building material, while that containing the oval or bran has two hundred pounds of bone material to the one thousand pounds.

We know of no substance of common diet containing more tooth-building material than brown wheat bread or oatmeal. We are told that while the retention of the bran on wheat makes it more valuable in this respect, the removal of husk from the oat adds to this element the phosphate of lime predominating in the body of the grain.

All food-stuffs containing the earthy salts—salts of lime, phosphate of magnesia, etc.—are best calculated to promote the formation of strong teeth, and should be prominent in the diet of mothers and infants.

While it is true the calcification of the teeth begins about five months previous to birth, and that defective development is mostly attributable to constitutional conditions of parent and child during the growth in fetal life and infancy, the complete calcification of all the teeth is not finished until about the mature growth of the individual; hence much benefit is derived by a continued direction of such food as will necessarily convey to the blood an excess of earthy salts. It is a deficiency of this substance that makes a tooth excessively porous and predisposed to decay.

In connection with proper nutrition add daily sufficient out-door physical exercise to maintain all organs of the body in a healthy state of action, with at least eight hours' sleep, for it is while we sleep that we have the most active assimilation of nutrition and restoration of general organism.

The second most essential feature as a preventive is cleanliness, and this naturally leads up to the consideration of antiseptics as a preventive of oral disease. I hoped to be able to present something along this line that would be of special interest to the dental profession. So far as our experiments have extended, we are not yet able to report any substance that will destroy mouth bacteria

spores, using it sufficiently diluted that it will not also destroy the mucous membrane. Hence we emphasize it is still impossible to sterilize the oral cavity with the use of medicinal agents. But since Dr. Miller has demonstrated that tooth decay is a chemico-parasitical process, and that the action of bacteria is a secondary consideration, simply dissolving out the tooth-structure after the acids decalcify it, we might assert that clean teeth never decay, since these acids which effect the decalcification of the tooth are generated by the fermentation principally of starchy, saccharine substances in the food which find lodgment around and about the teeth; consequently if we mechanically clean the teeth we need give but little attention to antiseptics.

I would suggest, by way of parenthesis, that it matters not how persistently one may use brush and dentifrice, the teeth cannot be cleansed without the aid of silk dental floss to pass between them.

With reference to the removal of disease and its cause, we would say that every character of services that the dental surgeon is asked to perform falls under the above heading. We assert, however, that insufficient attention is given to the hygiene of children's mouths. Most children have decayed teeth, and the majority of them have, going further, "suppurating sinuses," and not infrequently are kept awake at night. Under such conditions digestion is impaired, food is improperly masticated, the impure discharges of abscesses are taken into the system, and the child is physically depressed; and the developing permanent teeth must necessarily suffer as the result of constitutional disturbances, thus producing an irreparable loss. The crowning success of the dentist is to restore to normal appearance the dental tissues when broken down. How often we see the work of the dentist tending toward the lack of hygienic rather than hygienic conditions. We need but to mention such instances as the filling of two approximal bicuspid or molar cavities, leaving the surfaces flat or, as sometimes noted, V-shaped, and we at once have suggested to our minds the constantly associated gingivitis, either simple or ulcerated, and too frequent the breaking down of the tissues, the development of Riggs's disease, and ultimately the loss of the organs; or at other times an ill-fitting crown or bridge, which offers an incubator for putrefactive development. Under such conditions the services of the dentist prove a detriment instead of a benefit to the patient.

Dentists in the Army and Navy.

[The resolution offered by Dr. Chapple was read.]

DISCUSSION.

DR. WALKER: Allow me to suggest a change in the wording of the resolution, as no other branches of the National Association have yet been organized.

THE CHAIR: You have heard the resolution; are you ready for the question?

DR. T. P. HINMAN: What provision has been made to defray the expenses of a committee going to Washington on this business?

THE CHAIR: The committee may be composed of members of the Association residing in Washington, in which case there would be no question of expense.

DR. CHAPPLE: The subject is of such importance to the dental profession that I feel sure the services required would gladly be rendered gratuitously.

DR. CRAWFORD: As I have said on a previous occasion, there is no hindrance in this matter except that we simply do not avail ourselves of our opportunities. There is a very easy way to do it. Let some of the young men now in the colleges which have adopted the highest standards perfect themselves in a medical education; and, instead of the Association memorializing Congress, let the young dentists who are qualified by such a medical education as fits them for the position get their members of Congress to have them appointed to the position. Then we would have dental surgeons in the army and navy. The chief trouble in the way of this, as of many other advances in the right direction, is that we attach too much importance to the sayings of newspaper men about our Congressmen and legislators—that they are mean; that

they haven't got sense enough; that they don't know right from wrong, etc. We know that the army and navy ought to have dental surgeons, but we think our members of Congress haven't got sense enough to understand that; we have more confidence in their honesty than in their intelligence. That they will say, "Oh, we can't do that, for then the oculists will want a place, and the rhinologists will want a place." But let any regularly educated surgeon who is also a dental surgeon get the appointment, and show the efficiency of dental services rendered to the men in the ranks, and we would soon have enough dentists in the army and navy.

DR. L. M. COWARDIN: I am opposed to this resolution because, in the first place, I don't think that, as a branch of the National, we should be the first to appoint a committee to go to Washington on this important business. It would be more becoming that we, as a branch, send such a resolution to President Fillebrown, asking him to appoint a committee from each division. We should remember the proverb and make haste slowly. Wait until we have a sufficient number of men who have the double degree of dentistry and medicine before we push this thing.

THE CHAIR: I cannot agree with the objection to this resolution. A committee of members residing in Baltimore and Washington could do no harm, and might do much good.

DR. CHAPPLE: Dr. Cowardin says it would be better that, instead of the branch appointing the committee, we send a resolution to the National Association, asking for the appointment of such a committee. I agree with all that Dr. Cowardin has said on the subject, but if we keep on hammering at it we may eventually accomplish something. If we do nothing in the matter we will never get anything. The time has arrived to press this matter. Surgeon-General Sternberg, who has recently returned from Europe, has indorsed strongly the appropriation for a dental pathologist to the Army Medical Museum, and I feel sure that he would also indorse the present movement. Senator Chandler, in the debate on this appropriation, called attention to the suffering to which soldiers and sailors were exposed unless their teeth were sound and well preserved, and said that every member ought to vote unanimously that the teeth and jaws of our soldiers and sailors ought to be preserved; that they ought to be cared for judiciously

and liberally. If outsiders can see the necessity for such services, we certainly ought to do all we can to push the matter. Let us have this committee. I move that we act on this question now.

DR. COWARDIN: I move as an amendment that we send this up through the President of the National Association, desiring him to appoint committees from the different divisions; we should not forestall the President of the National Association in such an important matter.

THE CHAIR: Do you accept the substitute?

DR. CHAPPLE: If it is the choice of the Association.

A vote being taken on the substitute, and a division called for, it was lost.

The resolution as offered by Dr. Chapple was adopted.

The X Ray.

ADDRESS BY T. P. HINMAN, D.D.S., ATLANTA, GA.

MR. PRESIDENT, LADIES AND GENTLEMEN: I have here what is commonly known as the X ray apparatus. Before I show you its workings I wish to make some preliminary remarks explanatory of the phenomena. To have an idea of Roentgen's great discovery of what he modestly calls "the X ray"—the unknown ray, "X," as you know, representing "the unknown quantity" in mathematics—it is necessary to have some conception of what led up to this marvelous discovery. I will not go into details, but, briefly stated, Faraday first, in the course of a series of experiments, observed that a coil of wire wound around a core of small wire greatly increased the force of the electric current. But, before going further, I must explain or define certain terms which we are obliged to use in speaking of electricity. Every science has its own language, with its technical terms, which must be understood in their specific application in order to comprehend the most primary principles of the science. Thus, in the language of the science of electricity, the term *volt* indicates the unit of force; the *ampere* is the unit of flow of current; the *ohm* is the unit of resistance.

Crookes, an eminent English physicist, in experimenting in a different line, devised what is known as the Crookes tube, creating a vacuum of 1,000,000 of an atmosphere.

Lenard, in studying the phenomena of the vacuum within the Crookes tube excited by the electric current, found that a stream of electrical projection passed out of the tube and would cast a shadow upon an opaque substance of one less opaque.

Professor Roentgen accidentally noticed that the rays from the Crookes tube, excited by the electric current, caused a piece of fluorescent material within the range of the rays to glow and emit light. Further experiments led to the discovery that the rays would

penetrate objects heretofore deemed impenetrable to light, and cast a shadow of objects upon photographic film,—objects such as wood, coins, the bones of the hand, etc. There are various ways of inducing the electric current, and various forms of coil used in these experiments. A current of 10 volts and 7½ amperes when passed through this coil gives a continuous spark from point to point. If a spark is repeatedly broken and renewed with great rapidity, the force is much greater than if not interrupted. An exhausted Crookes tube contains but one one-millionth part of atmospheric air, and therefore but very few molecules, the electric current jumping from one to the other with the greatest force and rapidity, passing from the cathode and striking a metallic disk,—the anti-cathode,—when they are mechanically thrown outward.

Dr. Hinman spoke of the practical application of the X ray in dental diagnosis as daily becoming more and more valuable, as we become more familiar with better methods. In one case a mouth presented with both deciduous cuspids in position in the mouth of a child fourteen years old. A radiograph showed that there were no permanent cuspids in the maxilla, thus showing the necessity for retaining the deciduous teeth, which otherwise would probably have been extracted.

The hall was then darkened, and a series of lantern slides exhibited, showing to some extent the scope of the X ray sciographs or shadow pictures. One picture showed the imperfect ossification of the bones of a four-year-old child; another the well-ossified joints of the hand of a child fourteen years old. He showed the bones of the wrist, a knee-cap, a flexed elbow, a foot photographed through the shoe, a child's heel with a broken-off needle in the bone, etc.

The ladies were then invited to come forward one by one and, by means of the calcium tungstate screen, permitted to see the bones of their own hands, wrists, etc. The gentlemen then had their turn.

THE CHAIR: No one knows the trouble it is to pack up and transport such an expensive apparatus. I am sure that we all appreciate this interesting entertainment.

DR. G. F. S. WRIGHT: I had a case in which I felt certain there was an impacted cuspid. I believe this apparatus would have shown it.

The Chemico-Metallic Theory.

Paper by J. V. HALLER, D.D.S., Wytheville, Va.

IF there is anything in this chemico-metallic theory, and I am inclined to believe there is, it is due solely to the chlorin liberated, which is a powerful disinfectant and deodorizer; and with the little broaches or points it can be generated within the very roots of diseased teeth, which is a great thing. Let me say, however, that it is not the chlorin itself which acts upon the organic putrefactive substances, but the free oxygen in a nascent state. Dry chlorin gas will neither bleach nor disinfect, but its action depends upon its power of combining with the hydrogen of water, liberating the oxygen, which does the work always.

Now as to my experiments. I find, if enough of the nitro-hydrochloric acid is employed to entirely dissolve the metal, the excess of nitric acid, acting upon the silver, will form silver nitrate, which will be thrown down as a white precipitate by the chlorin. This silver nitrate may be sufficient in quantity to discolor the tooth-structure in a very short time, although it is a question which can only be ascertained by experiment. There can be no doubt about a small amount of silver nitrate being formed on account of the great affinity of nitric acid for silver, no matter how small the quantity be.

DISCUSSION.

Dr. J. P. Corley: In the treatment of root-canals I have had very satisfactory results from the use of hydrozone. The cavity is filled with gutta-percha or unvulcanized rubber, through which the point of the hypodermic syringe is passed and the hydrozone forced through the canal and abscess sinus.

Dr. Cowardin: The method described by Dr. Corley would be very dangerous in cases where there was no fistulous opening, as it might give rise to ostitis.

DR. FRANK HOLLAND: There is no subject of greater importance to us than the proper cleansing and filling of the roots of teeth. When there is no fistulous opening we are liable to have very unpleasant results, if a portion of the decomposed contents of the root-canal is forced through the apical foramen. We are not always careful and cautious enough in our operations. We sometimes quite unexpectedly find a dead pulp; it may have died from traumatic injury. In removing the contents of the pulp-chamber too forcible use of cotton or bibulous paper in the cavity may drive a portion of the contents of the canals through the apical foramen and set up a great disturbance.

DR. J. Y. CRAWFORD: While we owe thanks to the gentleman for the painstaking effort he has made, I do not feel ready to accept his method. His diagrams show a commendable knowledge of the interior of the teeth, and I thank him for the efforts he has made to make this clear to us. I can remember when I did not appreciate the fact that the anterior root of the lower molars had two canals though usually but one foramen, though the lower anterior molar roots not infrequently have two foramina. I have had no experience in filling roots with these metallic points. The ingenious method of depositing nitrate of silver by electricity recently devised by a gentleman from Ohio has excited my interest, although I have not adopted it in contradistinction to the methods I have already adopted. I rather agree with Dr. Harlan, that the thing of treating and filling root-canals is not the big bugbear it has been made to appear. If we are painstaking we will succeed. I invited a young friend to attend a society meeting, mentioning as an inducement that a paper would be read on root-canal filling. "Oh," he replied, "I know all about that." I asked him what per cent. of failures he had,—five per cent., three per cent. He said he did not think he lost one per cent. He finally agreed that he thought he would like to hear what others might have to say about it. I told him that I thought it very possible he might hear something he did not know already. We lose sight of one important factor in our successes, and that is the natural closure at the apex. In many cases a slight subsequent soreness is a factor in the favorable result; there is an infiltrating action which closes up the foramen and makes it impervious. There are men who teach and believe that septic emanations from the dentinal tubuli are a factor

in subsequent troubles, but I say that any disturbance around the roots of teeth that have been filled, coming from other than outside causes, are the exception rather than the rule; that deposits close the apical end of the root from the outside; septic influences from the inside never get through the foramen unless of sufficient force to uncork the foramen. There is no question but that it does that sometimes, and even bursts the tooth. Nature's processes will close the apical foramen. It is not an uncommon accident that a broach is passed through the foramen, carrying morbific bacilli through; sometimes a bubble of air gets entangled between the apex and the filling; sometimes a little wad of cotton becomes lodged near the apex of a long-rooted cuspid tooth; fluids get in that cotton first and check nature's process. Trouble ensues, and when that cotton is found and removed pus follows. I will ask some of you what percentage of pulpless teeth treated do you think you lose? Dr. Noel, I ask you that question.

DR. L. G. NOEL: Probably about five per cent.

DR. CRAWFORD: Dr. Cook, what is your average?

DR. COOK: I do not think I lose over five per cent.

DR. CRAWFORD: I think we may judge from their replies that the better class of practitioners do not average more than five per cent. of failures in what is considered the greatest bugbear in dental practice.

DR. NOEL: Our failures are generally with the root-canals of molars which are difficult of access. In many cases it is best to cut off the crown so that we can get fairly at the root-canals, fill them properly, and put on a good artificial crown. When there is a large cavity on the distal surface of a molar, which is difficult to get at and which weakens the tooth very materially, I believe it is good practice to put on a good artificial crown. Cut off the crown and grind down the tooth until you have a good, solid foundation. Remove all broken walls, but leave the bottom of the pulp-chamber as nature has formed it. Of late I use nitrate of silver a great deal. When I want a baby molar to be tolerated for three or four years longer, until the first molar is ready to come forward, I clean out the decay, treat with peroxid of hydrogen, saturate with nitrate of silver, and fill with copper amalgam. That is one place where we want copper amalgam.

Some Hints on Crown- and Bridge-Work.

PAPER BY DR. C. L. ALEXANDER, CHAIRMAN, CHARLOTTE, N. C.

MR. PRESIDENT AND MEMBERS OF THE SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION: I am pleased to be with you to-day, and, as I expect to be greatly benefited by what I hear and see of the work offered by your various committees, I am forced to acknowledge that it is with a feeling of humiliation that your Chairman of the Committee on Prosthetic Dentistry failed to get a single paper from that Committee (including the Chairman). However, Dr. W. E. Walker, of Pass Christian, Miss., has kindly come to our support, and offers a descriptive paper entitled "A Hygienic and Esthetic Crown."

In lieu of a proper report and the want of a paper from the Committee, with your permission I will make a few remarks with the hope of creating a discussion on this subject, which may not be brought out by Dr. Walker's paper.

The uplifting of the dental profession is as largely due to the advancement and wonderful conceptions which have been attained in this branch of the art as to any of those specialties which are given prominence.

To attain perfection in this department all work in the future must be constructed with a view to perfect hygienic relation, as well as to the esthetic appearance. I am happy to report that recent publications show that this condition is receiving marked consideration at the hands of those members of the profession who are interested in prosthetic dentistry.

Many of us have learned from experience that the nearer approach we make to perfection in this work, the clearer our judgment becomes in pointing out defects.

These observations stimulate me to offer a few suggestions or

hints, which I hope will be received with toleration on your part, since I may be telling you something you have known all the time.

To accomplish results pleasing to yourself and your patient in constructing crown- and bridge-work, all the preliminary work on the teeth must be thoroughly done; the gums must be restored to health, and the dead teeth, if any present, must be treated and filled. Unless you are successful in this undertaking, it would be wise in all cases not to proceed any farther, but resort to other methods. If, however, your patient insists that you carry out the original plan, you should have it understood that he assumes the responsibility, and is not to censure you if disastrous results follow.

When shell crowns are to be placed, either as individual crowns or bridge abutments, be sure that the teeth are so prepared that the work when finished will be a perfect fit, extending well down under the gum-margin. This can be so accurately done that it will not act as a constant irritant; at the same time it will exclude the possibility of further decay. I no longer find it necessary to band teeth where porcelain facings are to be used; by making a bevel on the edge of the root to be crowned, where you desire great strength, a ferrule can be formed by burnishing gold plate down over the part, which, when united to the crown proper, makes a very strong attachment.

I would suggest the use of cast abutments instead of open-face band attachments where you desire to avoid a display of gold. You will always receive the thanks of your patient and the public at large by avoiding this horrible deformity.

I am inclined to believe that many failures and much clumsiness observed in crown- and bridge-work are due to having the gold for the bands and the cusps too thick. For making bands I use coin gold, rolled to 31 American standard gauge. This form of gold is tough, having requisite strength and pliability. The backings and cusps should be made of 24-carat gold, rolled very thin; say 38 gauge.

For the base of cast fillings, and cast abutments for bridges, I use 24-carat gold rolled very thin, using two thicknesses, Nos. 38 and 46; the thickest for the base, the thinner for covering the wax contour. No. 30 rolled gold is easily secured, and makes a good covering for the wax.

In making crown- and bridge-work never lose sight of the fact

that the typical self-clearing space will be appreciated by your patient from a hygienic standpoint, and add to the durability and life of the work.

Much could be and has been said regarding dental plates. The improvement in this class of work has been aggressive. Continuous gum stands first when we are forced to resort to substitutes of this kind. Rubber plates lined with gold give great satisfaction and comfort to the unfortunate one, and probably stand next to continuous gum in merit.

I submit these remarks for what they are worth, but feel confident the discussion of prosthetic dentistry will be more interesting.

The Chapin A. Harris Memorial.

Paper by WM. ERNEST WALKER, D.D.S., Pass Christian, Miss.

Mr. President and Members of the Association: I wish to call your attention to the matter of the Chapin A. Harris Memorial, a subject which has been agitated for many years. Reference to the Transactions of the Southern Dental Association shows that at the annual meeting of 1894 Dr. T. H. Parramore (in the name of Dr. W. W. H. Thackston, who was prevented by serious illness from being present) stated that a movement had been started in the Dental Association of Virginia looking toward a fitting monument to the memory of Chapin A. Harris, and that they desired that the Southern Dental Association take a hand in the work. On motion of Dr. George J. Friedrichs, and amended by Dr. W. G. Browne, the Corresponding Secretary was instructed to correspond with the secretaries of the State and local societies, to secure their co-operation. Dr. E. P. Beadles, then the Secretary, promised to write the letters, and Dr. H. E. Beach was elected treasurer of the fund to be thus accumulated—"The Chapin A. Harris Memorial Fund." Dr. B. Holly Smith stated that four years earlier the sum of two hundred and forty dollars had been raised by the "Chapin A. Harris Association," organized in the city of Baltimore for the same purpose, which sum he thought could be diverted to the movement started by Dr. Parramore and form a nucleus for the project. Drs. B. H. Smith, J. Y. Crawford, and John S. Thompson were also appointed a committee to bring the matter before the American Dental Association.

The following year I received a circular from the Snowden & Cowman Manufacturing Company, of Baltimore, soliciting contributions for a similar fund. This circular made no mention of the

"Chapin A. Harris Association," of Baltimore, to which Dr. B. Holly Smith made reference; nor of the action of the Virginia State Dental Association; nor of the movement inaugurated in the Southern Dental Association, with the anticipated co-operation of the various State Dental Associations. Therefore there are apparently four and perhaps more organizations at work with the object of securing funds for the erection of a memorial to the memory of Chapin A. Harris. Having contributed my mite to the Snowden & Cowman organization in 1895, in November last I received a second circular proposing that the object of the fund be changed from a monument to memorial tablets, to be placed in the dental colleges of Baltimore, and requesting authorization for such employment of the fund raised.

I have deferred reply to this circular, thinking it advisable to bring the whole matter once more before this body, that we may arrive at some concerted action, and also learn the results of the action taken by this Association at Old Point Comfort in 1894. I therefore beg you, Mr. President, to call for a report, first, from Dr. E. P. Beadles, Corresponding Secretary of this Association at that meeting, as to the result of the letters which were to be written to the different State Associations; also from Dr. George J. Friedrichs, who voluntarily made himself "responsible for the State of Louisiana." Second, a report from Dr. H. E. Beach, the elected treasurer of the Chapin A. Harris Memorial Fund of the combined Southern Dental and several State Associations. Third, from the committee appointed to bring the matter before the American Dental Association. We would be pleased also to know what further action, if any, has been taken by the Chapin A. Harris Association, of Baltimore, in regard to the sum of two hundred and forty dollars raised in 1890, and conditionally proffered by Dr. B. Holly Smith as a nucleus for the Southern Dental Association fund; and also the results of the movement in the Virginia Dental Association. When we shall have received this information and heard these various reports, we shall be better prepared to take action in the matter and decide what we want; whether it shall be the memorial tablets proposed by the Snowden & Cowman Company, or, should the funds from these various organizations prove sufficient when consolidated, the monument originally projected. Other suggestions have been made, as a shaft, a dental library, an

exhibit of all the dental instruments, from the earliest to those of the present day, etc.

In view of the action of the Associations in regard to the Army Medical Museum and Library, it might be desirable, in view of greater prominence to be attained, that a memorial tablet be placed there similar to those projected for the dental colleges in Baltimore. While tablets placed before the students of these colleges would doubtless serve to perpetuate the memory of Chapin A. Harris among future generations of dentists, it strikes me that a *portrait bust* of Dr. Harris, mounted on a properly inscribed pedestal suitably located in the Army Medical Museum, would be a more worthy tribute to the name of Chapin A. Harris as indicating the estimation in which he is held by the dental profession as the founder of the first dental college in the world, the editor of the first journal devoted to dental literature, and the author of the first standard works of dental science. This will, however, properly become matter for consideration after we shall have heard the reports called for.

DISCUSSION.

DR. E. P. BEADLES: I remember very well the discussion of this matter at Old Point Comfort, and the appointment of the committees, as stated by Dr. Walker. I will say that I did a very considerable amount of letter-writing in the matter, writing to the secretaries of the different State societies. Instructions were given for replies and contributions to be sent to Dr. H. E. Beach, the treasurer of the fund which it was hoped would be raised in that way. As Dr. Beach is not here, we cannot have any report as to results.

DR. B. HOLLY SMITH: I have learned to-night for the first time that I was appointed chairman of a committee to bring this matter before the American Dental Association. I do not doubt that such was the fact, but I had not heard of it before. A number of years ago I took a very active interest in this matter. I tried every way in the world, and did succeed so far as to raise the amount of two hundred and forty dollars. I have no control whatever of that fund, but I know that it is in existence, and I have no doubt but that those in charge of it would be glad to add it to any other funds that may be raised to commemorate the memory of the man who was all that has been stated. I have no right to say that it would be so

applied, but if requested by those interested in the matter I would be glad to call together the members of that early association and have action taken in this matter. I suppose I have written to two or three thousand people on this subject, but I became disheartened at the absolute absence of interest shown. I have talked to some who said they would prefer to contribute to a fund to pension off old practitioners now living who have practiced as many years as did Chapin A. Harris. I became discouraged and let the matter drop. I never saw the second circular that was read as having been sent out by Snowden & Cowman, but it would not be inappropriate that a memorial tablet should be placed in the college which was emphatically the creature of his efforts. But I think that could and should be done by the faculty and graduates of that institution.

DR. CRAWFORD: We are always talking about doing something of this kind, but we never do anything. Let us put our heads together and decide positively one way or the other. Do we want it done, or do we not? I move that Dr. Walker be appointed a committee of one to bring this matter before the National Association at Omaha next summer, and that we, as a body, obligate ourselves to push this matter along until we accomplish the object. That will be the proper time and place for this thing. There will be a big crowd there, and I am sure if it is properly pushed a thousand dollars can be raised right then and there, and Chapin A. Harris will have a monument worthy of his name.

DR. COWARDIN: I second the motion that Dr. Walker be requested to make it his duty to bring this matter up before the National Association.

DR. CRAWFORD: And that we, the members of this Society, obligate ourselves to be on hand and get action on it. Make it a success!

Committee on Chemistry.

REPORT BY DR. B. RUTLEDGE, CHAIRMAN.

MR. PRESIDENT AND GENTLEMEN OF THE SOUTHERN DENTAL ASSOCIATION: It is with regret that I, as Chairman of the Section of Chemistry, am before you without a regular report on this subject. It was my purpose to have prepared one deserving of your attention, but I have been hindered materially from so doing.

I fully realize that the paper which I have has but little merit in itself, but if it will serve as a precedent to future Chairmen of this Section to make an effort, at least, to have something of a report or paper of some kind, I will not regret having read this short paper.

The distance between the alchemist of the time of Suida and the analytic chemist of to-day is very great, and yet the old alchemist who sought to make gold by the combination of baser metals was the legitimate forerunner of our modern chemist.

The relation of modern chemistry to the alchemy of Aristotle is unique.

There can be no question about the knowledge of the ancients of a considerable number of the basic facts of the science of chemistry. They were acquainted with the rules of extraction of several metals from the ores. They knew, too, the art of dyeing, tanning, and glass-making, but equally true that they knew absolutely nothing of the classification of chemical phenomena or of chemical analysis and synthesis.

The Chinese of the year 2000 B.C. gave as the elements of nature earth, air, fire, water, and ether, thus showing that as far back as that the ancients had some knowledge of some of the fundamentals of the science of chemistry. In ancient times, however, all study of natural phenomena was undertaken for the purpose of making gold or of finding the philosopher's stone. In the

reign of Diocletian mention is made by Suida of a decree of the Emperor forbidding the exercise of the mysteries of alchemy, fearing that some method might be discovered for making gold, and thus weaken the power of the Empire.

The alchemy of the Greeks and Romans was communicated to the Arabs, Italians, French, Germans, and English, and was diligently studied by them during the dark ages. The developments of the science of chemistry from the practice of alchemy—oftentimes by impostors who imposed on the credulity of the ignorant masses—is one of the most interesting studies that can engage your attention. We have not the time in this paper to go into the details, but only for a brief sketch of the most salient facts of this long period of development.

After the theories of Aristotle, Tholus, and Heraclitus had been exploded came the theory of Paracelsus, that the true use of chemistry is not to make gold, but to prepare medicines. He declared that all the elements were composed of three principles, sideric salts, sulfur, and mercury. Here for the first time we have intelligent efforts to find out the properties of bodies, but it remained for a later period for Robert Boyle to show the relations, connections, and limitations of these properties. Priestley, Lavosier, and Cavendish, however, are the men who really bore the honor of finally having first reduced the vague and unsatisfactory processes of the alchemists to anything like a true science.

The old alchemists, in their search for gold and the philosopher's stone, by accidental discoveries paved the way for modern chemistry. How wonderful in the author of nature to use the greed of the alchemists to blaze the way for the discoveries of many of the hidden secrets of nature!

The importance of a knowledge of chemistry to all men cannot be overstated. In all the developments of life the chemist fills an important place. Many of the utilities of life, as well as the esthetic pleasures, come to us a heritage from the science of chemistry. In commerce we find the work of the chemist plays an important part. Many articles of exchange and trade are largely possible because of the discoveries of the chemist. In art the chemist has his place; in manufactures he is a necessity, but not only in the trades, etc., but also in the various professions is chemistry being more and more recognized as a very necessary adjunct. The the-

ologian finds his power greatly multiplied if he has a knowledge of chemistry. It will unfold to him a rich and fruitful field for illustrations.

The lawyer without the knowledge of this science is often at great disadvantage in examining witnesses, especially in trials of poisoning where he has to cross-examine expert testimony. The forcible illustration of this fact was shown in the celebrated Maybrick case, in which the defendant's interest suffered materially on account of her lawyer's ignorance of chemistry.

In a profession of medicine it would be most natural to suppose that every physician was somewhat of a chemist. It is a lamentable fact that a large per cent. of our medical colleges practically require no chemistry for the degree of M.D., and as a result few of the remedial agents of any value are discovered here, but come to us from foreign lands. It is but just to state, however, that a better condition of affairs is beginning to exist in the better class of our medical colleges.

In the earlier days of dental colleges chemistry was a mere side issue; such a thing as placing a student in a chemical laboratory was an unheard-of thing. Practically there was no attention given to the science of chemistry. How gratifying to note a change on this line, and that the importance of this subject has been recognized by all the best colleges of our country. The question naturally arises, why this change and recognition? One reason we would say is because dentistry is not a mechanical trade, as in its early history, but is a progressive profession, requiring accurate thinking, constant research after truths, and the application of known theories and principles, together with trained handling and delicate manipulation of known materials, and there is no one science the study of which is so fruitful in supplying these professional requirements as is a theoretical and experimental study of chemistry.

But the study of the science should not be pursued simply at the college. Every practitioner who has the elevation of his profession at heart and desires the greatest success in treating the many lesions of the oral cavity must continue the study of this important science.

Now for a few special and practical suggestions in which chemistry has largely to do with the dentist's success.

Who would attempt to fill teeth and hope to do so with any degree of success without first selecting the proper filling-materials, having due regard to their chemical properties, color, density, conducting power, malleability, plasticity, etc.?

No one would attempt to do so but a mechanic with one idea, who tries to fill all cavities with gold, especially the difficult ones, and thus shows his skill; or the plastic man, who believes in ease and comfort, even if it does not last. The hobbyist, or the man who keeps in the rut, never studies chemistry.

Then, again, chemistry has largely to do with methods. This is quite evident to every dentist with any experience at all. The gas which emanates from an artificial denture, or a piece of bridge-work where foreign substances or vitiated secretions lodge as a result of an improper method of construction, is far more convincing than argument of chemical decomposition; even where the method of construction is as perfect as the circumstances will permit, the antiseptic and disinfectant wash which chemistry supplies is a necessity. Then, too, the method of successful treatment of many lesions of the oral cavity is accomplished solely by the intelligent use of remedial agents which could not exist but for the science of chemistry.

We might go on and cite many specific operations which the intelligent dentist is called on to perform, and thus show his dependence upon a knowledge of this science. But this would necessarily make this paper too long, which the writer intends to be simply suggestive of some of the salient facts why every member of the profession should give more attention to the science of chemistry, and thus be a more potent factor for the upbuilding and elevation of dentistry.

We verily believe that if we, as a profession, would give more study and attention to this science the nostrums of quacks, so largely advertised in many of our dental journals (be it said to their shame), and used by unthinking dentists, would soon become a thing of the past.

In conclusion, we would say, incidentally, would it not be opportune for the Southern Dental Association at this time, the beginning of its new era, to take some action condemning not only nostrums, but the mediums through which they are advertised?

Chemistry.

PAPER BY C. A. BLAND, D.D.S., CHARLOTTE, N. C.

A CERTAIN author tells the following: "There was a very good little boy once who wanted to go to sea, and the captain asked him what he could do. He said he could do the multiplication table backward and paste sea-weed in a book; that he knew how many times the word 'begat' occurred in the Old Testament, and could recite 'The Boy stood on the Burning Deck' and Wordsworth's 'We Are Seven.' 'Werry good; werry good indeed. And kin you carry coals?'" This story serves to illustrate the importance of bringing our theories into practice. A man may have the theoretical part of the dental profession so that he can describe to the minutest detail this or that operation, and at the same time be incapable of performing skillfully the simplest work. Fortunately we have erred in the opposite direction. We have cultivated manual dexterity and neglected the theories. I say fortunately advisedly, for I contend that the chief aim of our profession is the ability to do, not to theorize. Now that we have built the foundation, we can with greater propriety begin the study of scientific questions. It has frequently been asked, "Is it necessary for a dentist to study chemistry?" There are many no doubt who consider the time devoted to this branch as lost. They do not stop to think that chemical action is constantly taking place. The mouth is a veritable laboratory, and unless we have some idea of the wonderful forces which slowly and surely are producing changes and variations innumerable how can we hope to make judicious selection of filling-materials? How can we combat the ravages of caries and the inroads of abrasion? It may not be possible for every dentist to become a thorough chemist. The subject is too vast to be mastered by one who does not make it a

specialty. However, it is necessary for him to be familiar with that part of chemistry which is intimately connected with the practice of dental surgery. The first work should be begun in the laboratory. The metals and their compounds challenge his attention. They should be treated with the various solvents, and the salts thus formed examined. The alloys, such as solders and amalgams, must be thoroughly understood, although they are not in reality chemical compounds, but molecular mixtures. The salivary secretions should be analyzed; their alkalinity or acidity noted; the oxyphosphates may be taken up in this connection, and their durability in mouths showing different reactions should be carefully considered. An analysis of tooth-substance is necessary in order to know what food to supply for building up poorly calcified dental organs.

The chemistry of caries is all-important. We are taught by some authorities that decalcification of tooth-substance is the result of lactic acid elaborated by micro-organisms. The excessive use of saccharine and starchy foods promotes the development of lactic acid, and in consequence hastens the destruction of the tooth. Thus we see, after all, decay is acknowledged by bacteriologists to be a chemical process, and must be treated from this standpoint. The salivary deposits present quite a field for chemical research. Tartar is said to contain uric acid and sodium urates. Thus by the aid of chemistry we are able to discover the peculiar pathological conditions attendant on excessive deposits of salivary calculus. The various antiseptics and disinfectants should be studied chemically, so we can possess an accurate knowledge of their potency in arresting and preventing putrefaction.

The mooted question in regard to the action of the mercury contained in amalgam and red rubber plates needs to have the searchlight of science turned on; a thorough investigation of the subject will result in much practical benefit. There are many operations in daily practice where an understanding of chemistry would be decidedly advantageous. For example, the process of bleaching teeth with pyrozone solutions. I once saw an attempt made to bleach a central incisor which had a corner restored by a large contour filling. The tooth was stained green, and was very unsightly. Several applications of pyrozone were made, but there was no perceptible change in the discoloration. At first I was

nonplussed, but a few days afterward, while reading a pamphlet on H_2O_2, I noticed the following explanation: "Where nickel posts or screws have been used to hold frail walls in building down these teeth, and a green metallic stain is presented from the salts of nickel, cut them off. Pyrozone will not bleach nickel, and chemistry has no agent yet discovered which will turn this green to white in teeth." Pyrozone does not act well on metallic or mineral stains, but when the discoloration is caused from a dead nerve it works beautifully. I could cite numerous cases which would prove that chemistry must not be neglected, but time will not permit of my doing so; therefore I ask your charitable consideration of this short and imperfect paper. I am not a chemist (you have probably made that discovery already). However, I consider the subject of vital importance, and hope it will receive some attention.

We dentists are no longer looked upon as charlatans, but as an army of scientists working for the benefit of mankind. Let us continue this praiseworthy aggressiveness. Let our determination possess the indestructible property of matter. Let us have a chemical affinity for knowledge; then, indeed, will success crown our efforts.

DISCUSSION.

DR. B. HOLLY SMITH: It is a source of pride, and the society is to be congratulated upon the fact that her young men are willing and able to shoulder the responsibility of preparing papers for this Association. The papers are clear, concise, and well considered, and show the importance of being well grounded in the fundamental principles of science. No one can follow Leon Williams and appreciate his photo-micrographs unless he has some knowledge of histology, bacteriology, and microscopy. No man can follow Dr. G. V. Black in his experiments with amalgams unless he has some knowledge of the physical qualities of metals. If we would have any position in the professional world we must have a fund of general information. The man who restricts himself to one field, who rides a hobby, is a narrow, constricted creature. We must broaden out our scope if we would hold a position as teachers and leaders.

DR. CHAPPLE: I heartily indorse the remarks of Dr. Smith. The study of chemistry has received too little encouragement. A knowledge of chemistry is essential to hygiene. If the ideal per-

fect filling-material is to be evolved it will be through a knowledge of chemistry. If our predecessors had had more knowledge of chemistry we would have had better cements and amalgams. A knowledge of chemistry is necessary in combating decay of the teeth, in administering various remedies, in the application of various medicaments. I congratulate the essayists on their excellent papers.

DR. J. P. CORLEY: As illustrating the truth of Dr. Chapple's remarks, I will cite a not very pleasing incident in my own experience, when I was first turned loose upon a confiding public. A lady came in who had broken a section of gum teeth from her plate. I happened to have just received a box of cement advertised for use between gum sections by those unfortunate fellows who cannot grind a close joint. I thought it was a brilliant idea to set a section on the plate with that cement, but the next day the lady returned with her lips very much swollen and ulcerated. She was suffering very severely. Remembering what I had used, I hunted up my package of cement, and for the first time looked up the formula and found to my dismay that one of the ingredients was arsenic. Of course, we don't tell these things to outsiders; this is all in the family.

Dental Histology and Microscopy.

Paper by W. E. DRISCOLL, Manatee, Fla.

IN the wonderful strides of advancement in dental theory and practice in the past twenty-five years, dental histology and microscopy have kept close company with the operative and prosthetic branches. It is these splendid advances that should make every member of our profession proud to be called a dentist, instead of lamenting that there is something to be envied in the man who may write M.D. after his name as compared with D.D.S. To all such I wish to say that, in a strictly scientific sense, there is nothing in connection with medicine that offers a wider or more honorable field for distinction than is now open to all in dental histology and microscopy. The dental office and practice affords an ideal condition for the pursuit of these studies. Our usual manipulations prepare us for the work of histologists and microscopists as no other work can. While one is young, his hand steady, his eyes clear and health good, and patients few, he can lay the foundation for a fame that will live for all time better in these studies than any other now beckoning us onward and upward. To the young man whose list of appointments almost daily allows two or three hours to be disposed of as he pleases, what better plan than to occupy them with these studies? They would keep him at his office, when otherwise he might miss by absence, possibly at the pool-room, many valuable patients; some who, if they had found him employed with his microscope, would have been so favorably impressed as to recommend him to many others. I speak from personal experience to some extent on this point. The microscope is far better company for your lady callers to find you engaged with than the floating young man of the town, who often leads one to engage in games in business hours that make a

very unfavorable impression upon all who become aware of the fact.

I desire to impress these views of the matter upon our younger members, because so many look entirely to immediate cash returns for their time and efforts. There is no need of taking an hour from the service to our patients where one wants to increase his business. And, as I have shown, there is no better way to make a reputation among the people than to engage in this work, and thus impress them with your claims of being a man of habits and tastes befitting the profession of dentistry in its best aspect.

There can be no question that, unless members of our profession avail themselves of such accessories and become men of real scientific attainments, the "steam dental companies" and "great (blank) dental associations," whether composed of one man or more in each case, will gradually degrade the art to such a degree that there will be good reason for self-respecting, educated men being ashamed to be called dentists. This concerns young members of our profession who have a lifetime before them, to be made either one of success and honor or one of failure and comparative degradation. The past of dentistry is secure. Will the young men now pressing for recognition see that in their hand no lowering of its standards shall be permitted? This does not mean any relaxation in pushing every branch of our work, but assumes that all branches will be stimulated and advanced as our members more generally become expert in all that pertains to dental histology and microscopy. This view of the matter has been extorted from me by the new discoveries and uprooting of what were accepted doctrines for years after I became a dentist, and such doctrines were taught by men who had in many ways earned a right to be classed as authorities. But later investigations have proved they were wrong, and I was wrong with them.

It is such facts that should impress upon us the immense importance of these studies. While very much has been done, we may well believe that the greatest achievements are yet to be realized. To be one among the benefactors of mankind in such work is the most satisfying reflection that can come to a man when he surveys his work and looks for a sufficient reason why he was ever born or lived. I will not deny that I would have preferred to bring you something new in the line of histological and micro-

scopical research than to exhort the young men to do what I have failed to do. But confession is good for the soul, and I freely make this one, that when I abandoned the study of these subjects twenty-five years ago, just as names were beginning to be made that will live when I am forgotten, I then made the greatest mistake of a lifetime. Such will be the reflection of most of the young men in time, who hear or read this paper, unless they do all in their power to earn the claim that they have done what they could. Hence, as I could only give you data under the heading of this paper which can be found in better shape in the standard literature of our profession, not having been an original investigator, it should be evident that I have discharged my duty under the call of the Chairman of our Committee on Dental Histology and Microscopy best by confining myself to this exhortation to the young men of our profession.

Of course, only a portion can expect to become famous in this work, but every one will be benefited individually; and his familiarity with these subjects will benefit his professional associates, since such study will naturally lead to fraternity and association among practitioners contiguous to each other. So that instead of the study leading to isolation, it should have the reverse effect. Is it not about time that the southern half of this country should produce men who lead in such investigations? Such rivalry is to be commended. If such advancement is not to be encouraged, why maintain the Southern Dental Association? Only such friendly rivalry has any place properly among scientific men.

I am anxious to reserve one merit at least for this paper; that is, brevity. And I will not dissipate any impression I have made by tiring you, but I wish to say that if any one is induced to press onward in the lines here indicated I would be pleased to hear from him; and I sincerely hope the seed I am aiming to sow may not fall entirely on stony ground.

Report on Clinics.

THE Clinic Committee begs leave to make the following report: Dr. I. Simpson, of Rock Hill, S. C., filled a cervical cavity in the left superior cuspid without the use of rubber-dam or clamp. The doctor demonstrated the possibility of keeping these cavities dry without dam or clamp.

Dr. E. E. Cruzen, of Baltimore, presents an electric root-drier and method of repairing broken porcelain faces in bridge- and crown-work.

Mr. Pohlman presents a gold-plating solution to be used without batteries. This commends itself on account of its simplicity and the great rapidity of its work. It is to be used in plating regulating appliances and crowns and bridges after polishing.

Dr. H. H. Johnson, of Macon, Ga., demonstrated a method of articulating gold crown on molar teeth. By using models, he was enabled to thoroughly explain his very valuable method in a very satisfactory manner.

Dr. E. B. Marshall, Rome, Ga., showed a very interesting and original matrix to be used in plastic fillings. It is very readily adjusted to the teeth and is easily removed without disturbing the filling.

Dr. Chas. Alexander, of Charlotte, N. C., exhibited a number of models showing many original methods of backing teeth, making and mounting crowns, and casting fillings. This proved a very interesting clinic.

Dr. Cowardin demonstrated cataphoresis, anesthetizing two very sensitive cavities in the lateral and central incisor. Used S. S. W. improved apparatus; anesthesia in fifteen minutes. He calls attention to the electrolytic action upon the medicaments, which has not before been noticed in any article published to his knowledge, fearing that said action will result in chemical deterioration of tooth-structure by the liberation of oxygen.

Dr. J. Y. Crawford, Nashville, Tenn. Double cavity in second upper molar, left side. Removed cement filling, finding a considerable quantity of decay, which is quite usual under all such fillings of cement in the mouths of patients under the meridian of life that have been filled for any length of time. The cavities were prepared in the usual way, cutting down the septum, turning the two cavities into one rather large one. Covered the bottom well with two mats of No. 4 tin foil, packing the same in well, after which placed a roll of bibulous paper under the cheek; piece of rubber-dam under the napkin to prevent leaking, pinned the same on to keep the cavity thoroughly dry, proceeded to pack the cavity full of large mats of No. 4 Abbey non-cohesive gold foil, allowing them to extrude almost equal to the depth of the cavity; after thus packing and wedging them in, proceeded with hand pressure to thoroughly pack and condense by burnishing fillings in the usual way, with corundum points, fine finishing burs, sand-paper disks, and pressure of leather wheel.

Dr. Frank Holland, of Atlanta, Ga., filled a cervical cavity with cohesive gold, using electric mallet. He used an Ivory No. 9 clamp as a gum retractor. He demonstrated how easily the gum could be retracted in the most difficult cases with this valuable appliance.

L. G. NOEL.
THOS. P. HINMAN.

Incidents of Office Practice.

DR. W. E. WALKER: I have here a sequestrum which, as you see, includes nearly the entire length of the ramus. A lower first permanent molar had been extracted by a physician in the country because of an alveolar abscess which had developed a year earlier, in February, 1897. The tooth was extracted in April; necrosis ensued, and this piece, which was entirely sequestered, was removed in the beginning of the present month, through the sinus at the angle of the jaw,—at the gonion. It came away without the use of much force.

DR. NOEL: Do you know if the child had had diphtheria or scarlet fever, or anything of that kind?

DR. WALKER: Not that I am aware of, but I will inquire further into the history of the case.

DR. COWARDIN: I had a somewhat similar case two years ago—a little girl of six years of age. The first permanent molar had not yet erupted. She had taken cold, and the mother gave her three grains of calomel. The next morning she complained of pains in her face, with considerable swelling, which did not soften or abscess. Her dentist (in Washington City) said there was no trouble with the teeth. That was all the history I could get when I first saw the case some nine or twelve months after the beginning of the trouble. The bone was then necrosed from the lateral incisor to the condyloid process. It was to me an interesting case, showing the results of the administration of calomel not followed by the proper treatment.

DR. B. H. SMITH: In such cases we have the additional embarrassment of operating in a septic field. This portion (of the specimen exhibited by Dr. Walker), when it was united with the body of the bone, appears to have been quite denuded of periosteum. This ragged projection must have been a constant source of irritation.

Was any effort made to ascertain if the stump left was in such a condition as not to cause further irritation?

DR. WALKER: This piece was entirely sequestered. The other end was covered with granulation tissue, and was perfectly smooth.

DR. B. H. SMITH: This might have been from an aggravated case of stomatitis,—cancrum oris. It is an interesting specimen, and I am glad it has been presented.

DR. NOEL: Generally, when there is denudation of the alveolar process, there has been some violent inflammation preceding. This looks like a sequel of diphtheria,—inflammation diffused under the periosteum.

DR. WALKER: When I saw the case there was nothing like stomatitis or cancrum oris. The tissues of the mouth were in fairly healthy condition. The opposite first molar had also been extracted. The child was what country people call "quite a stump of a boy;" he was not anemic; in fact, he appeared to be a healthy child.

DR. NOEL: How long had it been in reaching the condition in which you found it?

DR. WALKER: The abscess occurred in February, 1897; the tooth was removed in April of the same year. This bone was removed in February, 1898.

DR. FRANK HOLLAND: Such a case of circumscribed necrosis could hardly be due to ulcerated mucous membrane. I feel sure that if the true history of the case were known it would be found that poultices had been used on the outside of the face.

DR. NOEL: Would that lift the periosteum and diffuse the abscess?

DR. HOLLAND: Yes, sir. I believe it would induce periostitis, etc., from the increased blood-supply.

DR. WALKER: Of course, poultices may have had something to do with it, and I will inquire about that point. The fact that it has been stated that it might be the sequel of diphtheria is a lesson to us that if diphtheria can cause such results, we should be very careful that we do not convey the diphtheria bacillus from one patient to another. The Klebs-Loeffler bacillus has frequently been found in the mouths of patients weeks (three in one case) after all signs of the disease had disappeared. In such a case the germs might readily be transferred by our instruments to other mouths.

In fact, the diphtheria bacillus has been found in the mouths of persons who were perfectly healthy, being immune to diphtheria, and yet that perfectly healthy person is liable to give diphtheria to other persons by kissing, coughing, etc. Is there any stronger argument than that needed for the sterilization of our instruments?

DR. B. HOLLY SMITH: I can cite a recent case bearing directly upon that point. I know of a dentist who contracted diphtheria from a patient who had been discharged by her physician as cured two months previously. Her clothing had been burned, her hair sterilized; she was wearing new garments, but two months afterward she gave the disease to her dentist. He had put the rubber-dam on a first permanent molar for a large occlusal cavity. After grinding it out he used the chip-blower, and some *débris* was blown into his nostrils and throat. And yet that patient had been discharged by the physician two months before. It is true, such a case might not occur again in a lifetime, but there it was. You may laugh at me, and call me a knight-errant for working with gloves on, but you cannot laugh me out of my position. I have a finger that has cost me a thousand dollars from cutting it with the edge of a sand-paper disk used in polishing a filling for an infected patient. I now use gloves in certain cases because I have been advised to do so by a surgeon, a distinguished syphilographer, who believes in attention to details. I deny the right of any one to ridicule these precautions.

DR. CRAWFORD: I am glad to see proper attention paid to this matter, for we are all liable to have wounded fingers, and should be familiar with antiseptic methods. I have always advocated finger work as better than so many machines, which are less efficient in dentistry than the human fingers. And I reckon I inflict as many wounds on my fingers as any man in the world. I will call up this question next year, and I am going to make a proposition. I have gotten so that invariably, when I puncture my finger, if it is done with a vicious instrument, I immediately turn to the drawer where I keep a roll of bibulous paper and tear off a ribbon, with which I wrap the wounded finger closely; then I wrap it with floss silk. If it bleeds I am not so careful, but if it does not bleed it becomes painful. Having wrapped it well, I immediately immerse it in alcohol. *There* is a clue to the understanding of something profound in medicine. I get relief in less time than it takes to tell it.

In no case do I ever get any ill results from wounds caused by my instruments. I do not say that it is a cure for syphilis, but I have never had any trouble from wounded fingers. You say that it is because of the anesthetic effect. I say it is more than that. My idea is that when the alcohol is absorbed into the organism *pari passu* with the toxin there is elaborated an antitoxin. If, simultaneously with the toxin influence, alcohol is introduced, it is the best antitoxin in the world. It elaborates within the organism something which annihilates the toxic influences. Try it. It will give you both hope and encouragement. I will also give you an efficient matrix. I walked into my laboratory looking for a piece of German silver. I had a lot of thin copper from the brush of an electric motor. I took a pair of scissors and cut off a piece, and with a pair of pliers twisted the ends of the band around the tooth tightly and firmly; and I had a perfect band matrix. Now I have elaborated upon that. In the construction of the next one I left a lip, which I pressed down over a cusp to hold it in place. It made the best matrix in the world.

DR. COWARDIN: This is not a case in office practice, but I have seen something here that I never saw before. The case was brought in by one of your local practitioners, and exhibited as a case of more than usual interest. The gentleman cannot bring his front teeth together, as if to bite a thread, without severe pain. In fact, he cannot bring them together on edge, though in normal occlusion they come together with a little effort but no pain; and he can open his mouth without any pain, but he cannot bite. There appears to be normal articulation of the joint, but there is probably some nerve disturbance. I have diagnosed it as a kind of rheumatoid arthrosis; there must be some wearing away of the surface of the bone. I call your attention to this case as one of peculiar interest.

DR. B. HOLLY SMITH: There is probably some thickening of the synovial membrane, causing pressure on the condyle and giving pain. He can close the jaws in the normal position without pain. I do not think there is any loss of substance, but there is probably a lack of proper lubrication, causing friction of the edges of the bone.

DR. QUATTLEBAUM: Dr. Crawford spoke of the virtues of alcohol. It is the best medicine for preserving teeth that are suitable for transplantation when you have no socket ready for imme-

diate implantation. A year ago I transplanted into a socket, from which I had removed a hopeless root, a tooth that had been in alcohol for two years and a month, and it is so far apparently a perfect success.

DR. W. E. WALKER: In the line of the case cited by Dr. Quattlebaum, I will mention a case of transplantation. A young lady presented with both right superior bicuspid roots incurably abscessed and the crowns gone. The roots were removed, and immediately replaced by two second bicuspids which had been extracted two weeks previous in a regulating case. The teeth were retained by Dr. Jack's method, the bandage having been made before the roots were extracted. The sockets were not syringed, and no saliva was allowed to enter them. The sterile teeth were inserted while the blood was still flowing. The case did well from the start, with no perceptible swelling, and in a few days the gum had a perfectly natural appearance. As I was just going to Atlanta (from Pass Christian), and the patient went into the country, the bandage remained in place a year. It is now nearly two years since the operation, which gives every promise of continuing to be a success.

DR. BEADLES: I will cite the case of a lady whose central incisor was replanted by Dr. Hunter, of North Carolina, fifteen years before I saw the case. She suffers from pyorrhea alveolaris, and states that this tooth was very badly affected. She says Dr. Hunter removed it, scraped it off, and polished it, but she does not think he cleaned out or filled the root-canal or removed the pulp. It is there to-day, and gives every indication of perfect health.

DR. B. HOLLY SMITH: Where is the opening into the pulp-chamber?

DR. BEADLES: There is no break whatever in the crown, though he may have filled the canal from the apex. I intend to write to Dr. Hunter about it, and ask him if he filled it. I have another peculiar case, which some of you may remember, as I reported it in the *Dental Cosmos*. A lady required the administration of chloroform. She said that she had taken it several times before, and that always, at the same hour every day, for a week or ten days she would sleep soundly for a little while; that she used effort to avert this unusual sleep, but could not resist it, and had to sleep for about half an hour. This may have been a case of hypnotic suggestion, and that if I had suggested that she could *not* sleep at that

hour she might have been able to resist it. But it did not occur to me to do so at the time.

DR. WALKER: Whenever I have a wounded finger that I am obliged to use about the mouth, I coat it with collodion before operating; this makes a very effectual protection.

DR. B. HOLLY SMITH: I have a whole chapter of accidents that I thought of relating, but have refrained, as the time seemed to be more profitably occupied. One was the case of a young man with a tooth broken off and very unsightly. I did not see the case until two months after the accident. He was very much averse to its removal, and the pulp was still vital. So I made a band, cutting a tin foil pattern. I adjusted an English porcelain face to the band, with a backing extending over the lingual surface of the tooth. The result was very satisfactory. I had a similar case for a girl twelve years old, who, being pushed in play, fell against the corner of a marble step, breaking off one central incisor and the mesial corner of the other. I restored the one with a porcelain crown, and a porcelain corner for the other, with a backing extending behind the other incisor.

I had a case where, without any decay, there was an exposure of the pulp from the wasting away of the cement under a crown. When the bridge was removed the pulp was found to be exposed, and the tooth exceedingly sensitive. With the end of a large-handled excavator I depressed a disk of backing metal in which to make an application to destroy the pulp. Over the tooth I molded a rubber cup-crown, and dismissed the patient. When he returned for the removal of the pulp he told me he had been able to masticate comfortably on that side in the mean time.

DR. T. P. HINMAN: I have recently had two cases that are quite peculiar. One was an incisor which showed at the cervical margin of the labial surface, extending under the gum, a spot showing red through the enamel, which, when opened into, revealed a large cavity filled with an apparent enlargement of the pulp; penetration of the instrument caused profuse bleeding. The crown was perfect, the enamel intact. At Old Point Comfort several years ago a dentist from Philadelphia, whose name I do not recall, described several similar cases, but this was the first one of the kind that I had met with. The second case was a child of twelve years old, whose inferior first molar had been extracted. The second molar

was just erupting. On the coronal surface, where the sulci cross, there was a red spot upon which pressure of an instrument was very painful. The family were on the point of going to Philadelphia, and I advised them to see Dr. Kirk. I have not heard from the case since.

DR. J. Y. CRAWFORD: I have two cases of a striking character, antagonizing the generally accepted belief that the teeth do not grow after eruption. Dr. Graham, of Tallahassee, removed a left central incisor which had several years before been the recipient of an injury from the kick of a mule, resulting in breaking the tooth across diagonally. The fragments of the tooth had grown together. I have the specimen in my office still, if it has not been lost. I have sent it to several gentlemen for examination; among others, Dr. Peirce, of Philadelphia. In another case spontaneous abrasion of the central incisor had produced a shallow cavity difficult to fill. I hesitated between an inlay or a filling. At a meeting of the Board of Examiners in our city I had several of the gentlemen present examine it; among others, Drs. Arrington and Beach saw it, and perhaps Dr. Cook. Some said cut it out sufficiently to fill with gold; others advised a porcelain inlay. As it was not pressing, and the party was going to Philadelphia, I gave him a card to Dr. Peirce. When he looked at it he said, "Did Dr. Crawford tell you it was a dead tooth?"

Nothing was done to the tooth at that time, but when they came back they told me what Dr. Peirce had said. Now, I pride myself somewhat as a diagnostician, and I could not make out that the tooth was dead. I showed it to a friend, who examined it carefully and could not see that it was dead. I decided to fill the cavity, and proceeded to cut it out, and met with no sensation. I cut to the pulp-cavity and found it absolutely vacant; not a trace or sign of a pulp, but at the point of junction of crown and root I found a disk of bone as perfect as if it had been artificially inserted —a perfectly established partition. I drilled through to see if it was sensitive beyond, but I found no sensitiveness and no signs of pulp-tissue. I treated antiseptically, filled with gutta-percha, with cement over that, and later I put a porcelain inlay in the cavity. The tooth has never given any trouble since.

Trigeminus Reflexes—Causes and Effects.

Paper by H. HERBERT JOHNSON, D.D.S., Macon, Ga.

THE subject with which this paper is intended to deal is one of common interest to the dentist, ophthalmologist, and aurist. It is thus broadly that the subject will be handled.

The trigeminus nerve and its branches is the most important plexus of nerves in the body. To the dentist it is *all* important, because there is not a nerve disorder coming under our specialty in which this nerve is not directly involved.

From the variety of functions it has to perform, the intricacy and complexity of its connections and distributions, reflexes difficult of diagnosis are more often met with in the territory of its ramifications than in any other. A thorough knowledge of its anatomy, together with its physiological and pathological manifestations, is, therefore, exceedingly desirable to be able to accurately diagnose the many perplexing cases which constantly come before us. I may here add that there are both physiological and pathological nervous reflexes. By a physiological reflex we mean an irritation or impression conveyed from the periphery through the fibers of a sensory nerve to a nerve center, usually the brain, from which it is reflected by a motor nerve to the muscular or other tissue by and through which these effects are manifested. The manifestations of these reflexes, while usually involuntary, may be, under ordinary circumstances, prevented or suspended by a voluntary effort of the mind. Physiological reflexes are generally for the accomplishment of some purpose, which is usually something desirable for the maintenance, growth, or well-being of the body.

Dr. Brubaker says that "it is clearly evident that the normal reflex act consists in such a distribution of the efferent impulses that the inciting irritation shall be accurately answered; that is,

that such motion of muscles, such dilation or contraction of the blood-vessels, such stimulation or inhibition of glands, etc., shall result that, in biological language, the organism shall correctly react to the environment and meet its stimuli in such a manner as to insure the healthful activity of the organs."

To the contrary in pathological reflexes, many of them being purposeless, meaningless, and contrary to the well-being of the body. Through some false connection in the wires the message has been switched off and carried to a wrong destination, and there is nothing to lead our minds in determining the source of origin of the impression,—no way of retracing the nerve current to the central office, and from thence to the point of irritation. But neither in health nor disease do these manifestations always come back to the point from whence emanated the impression. For example, the impression of the presence of food is made in the olfactories or optic nerves of a hungry individual, and the manifestation will come through the salivary glands. A severe irritation is continued on the periphery of a sensory nerve, and a pain is manifested in some parts remote from the source of irritation. This state of affairs is true of any part of the body, but in no locality is it so frequent as that supplied with sensation by the trigeminus nerve and its branches. And even in this locality it is met with more frequently in the terminal branches of the dental division. How often are we called upon to relieve odontalgia manifested in a superior tooth when its real origin is irritation of an inferior one, or *vice versa?* Or, as is frequently the case, the pain may not be referred to a tooth at all, but may assume a neuralgic character and manifest itself in some other locality, as the eye, ear, nose, or in the infra- or supra-orbital regions, evidences of pathological reflexes, but of meaningless and purposeless kind, having no reference to the seat of trouble. Although it is often met with in other teeth, the third superior molars are the most frequent source of reflex neurosis. This may be accounted for by the close proximity of the spheno-palatine ganglion, whose fibers anastomose with the fibers of other branches of the nerve, short-circuiting it, as it were, causing confusion of messages as when telephone wires are crossed.

Dr. F. C. Todd states that "it is almost invariable that an operation upon the anterior cartilaginous nasal septum will produce

neuralgia in the superior anterior teeth, due to the fact that the nasal septum is supplied with fibers from the nasal branch of the ophthalmic, which joins branches of the superior maxillary." Numerous interesting cases may be cited under this head, illustrating this curious action of the nerves in disease.

Case 1. A gentleman, lawyer by profession, had been treated for ten days for a severe neuralgia centered in the region of the left temple. No pain of any character had been felt in his teeth. Through desperation he came to me, hoping that the trouble might be located in his mouth. After careful examination a cavity was discovered in the posterior approximal surface of the second superior left upper molar, corresponding to the side of the head the pain had been centered in. The cavity was very difficult of access, having commenced at the gingival margin and extended upward toward the alveolar border. In attempting to explore it the probe slipped accidentally into the point of exposure. Placing his hand to his head he immediately exclaimed, "That felt as if you had driven a nail into my brain right there." Mind you, no pain was felt in the tooth. The nerve was killed, the tooth filled, and every twinge of pain experienced during the treating and filling was felt in the *temple and not in the tooth.* No pain was ever felt after the operation.

Case 2. A married lady, about thirty-five years of age, had been treated by a physician for chronic neuralgia for several months. She had had no trouble in her teeth, but came, hoping that something might be found to give relief. Both lower third molars were filled with cement on the buccal surface. Pains were not confined to any one side of the head or locality. Removed one of the fillings and destroyed the nerve; the pain ceased on *that* side. Being encouraged by this, removed the other filling and destroyed that nerve also. This completely cured the other side, with no return of pain for over a year, when I lost sight of the case. She often spoke of her terrible agony of suffering and how easily I relieved her after the physicians had treated her so long. I may state that I found pulp-nodules in both these teeth.

Case 3. A married lady, about thirty years of age, had been suffering intermittently with neuralgia of the left side of her face and head for several years. She had exceptionally fine teeth, none having ever required to be filled except some in front. Repeated

examinations had not revealed the source of trouble. From hard brushing the gum had receded some around the first upper molar, left side. As the trouble was becoming quite annoying, I determined to try for pulp-stones in this tooth. The nerve was accordingly killed, which proved very stubborn. Upon opening the pulp-chamber a layer of secondary dentin was found to have covered almost the entire floor of the chamber, and had nearly cut off communication with the roots. The nerve was killed and the tooth filled, and relief followed immediately.

These three cases being a little dissimilar from the many every-day cases of dental reflexes of a pathological character, I have reported them, thinking they might be of some interest.

Case 4. Dr. Brubaker reported a case where a lady suffered extremely with toothache for several days after undergoing a surgical operation in the nasal cavity. Here is an instance of peripheral irritation in a part being referred to the nerves of the teeth.

Case 5. Dr. Jonathan Hutchinson reported a case where ulceration of the cornea from injury produced severe pain in the teeth and ear.

Case 6. Dr. W. H. Morgan says in years past he had considerable practice among inmates of the Central Asylum of Tennessee. He reported a case in which the patient, a raving maniac, was cured by extracting offending teeth. Dr. Morgan says we have it in infancy, when the deciduous teeth are making their appearance; and from inability to control this action is due a large proportion of infantile mortality during the second summer.

In the "American System of Dentistry," pages 500 and 501, four very interesting cases of insanity are reported caused by dental irritation, showing very grave and interesting forms of trigeminus reflexes. These expressions from eminent men, as well as the few cases from my own personal experience, have been given to impress the fact upon my hearers and reading members of the profession that this question is of serious importance, and deserves more than passing notice. These evidences could be multiplied *ad infinitum*, but these few cases will suffice to call attention to the importance of the subject and open it up for discussion.

[At the conclusion of his paper, Dr. Johnson said that no subject could appeal more strongly to the sympathies of humanity than

the condition of the inmates of our lunatic asylums. He had been working for years in his State society in the effort to secure the services of dental surgeons in those institutions. He considered it of even greater importance than their appointment in the army and navy. He hoped the discussion of the paper would be from that point of view.]

DISCUSSION.

DR. J. Y. CRAWFORD: Dr. Johnson told me that he was about to bring up this subject, and asked me for an expression of opinion on the question of the appointment of dentists to insane asylums. I am prepared to say that every State institution that has a large number of inmates confined within its limits, any commonwealth that fails to provide for the care of the teeth of those under their charge, as carefully as of any other part of the organism, fails to provide as it ought to do for the care of its unfortunates. To my fullest extent I would encourage and approbate this idea.

The paper to which we have listened is one of great scientific importance. It enunciates a great doctrine. The question of reflex action as a factor in disturbances of the organism, in the production of disease, in increasing the percentage of mortality, is being seriously assailed at this moment.

While the dental profession has made marked advances in the past fifty years, while it has been *learning*, it has also been *forgetting*. The modern idea in medicine says there is no such thing as an idiopathic standpoint. The same element in medicine, moving in another direction, says the same of reflex action; a large element says there is no such thing as vicarious menstruation. The voice of science does not perhaps support the doctrine, but the voice of God Almighty says *it is so*. The fiat of God Almighty is on our side. Is the old doctrine true or not? Is idiopathy but a myth? All right; let it go. But now they would take away from dental surgery the vast field of nervous reflex action. The process of the eruption of the temporary teeth has nothing to do with infant mortality forsooth! Then I repudiate dentistry! Did you know that that doctrine is being assailed? I say that in no department is there so pronounced an exhibition of reflex action; nowhere is it so plainly expressed as in the domain, the purlieus, of dental surgery. This field belongs to us. When the new-born infant seeks to obtain sustenance reflex action causes atmospheric air to

rush in and fill the thoracic cavity, otherwise there would be no such thing as the breath of life.

Is there a dental surgeon here who has not seen the patient place the finger upon the second bicuspid when the seat of pain was in the third molar? If not, he has not been a close observer.

What is reflex action? What does it mean? Go home and think about it. Give its full meaning to the wonderful phenomenon of pain manifesting itself in one place which has its origin somewhere else; an injury to one part exerting an abnormal influence in another. One thing about us, which is also common to other departments of medicine, is that we forget what we see. You all recognize that the eye is involved in common with a tooth. I will say, however, that the tissues involved in the structure of the eyeball have comparative immunity from the effects of diseased teeth, but all other portions are liable to be affected; the eye is the first part in the organism to be thus involved. Do not forget, however, that the phenomena of reflex action rarely occur in connection with the teeth after the destruction of the pulp. It is true, we hear some cock-and-bull stories about nervous reflex action from an old root of a tooth that has been dead from time immemorial, but that man missed his case. I will give a good chromo to any man who will show me a case of reflex action from a dead tooth; and by that I mean a pulpless tooth.

Now, where is this reflex action most frequently exhibited in connection with the teeth? In the eye and the ear; in the temporal region, the superior and inferior orbital regions, the cranium, the neck, the shoulder, the bronchial region, and in the thoracic cavity. Careful observation as to correct diagnosis will demonstrate the truth of what I say. Mr. President, I believe it is a serious fact, the truth, the whole truth, and nothing but the truth, that the responsibility in this direction rests with the dental profession, with whom rests the possibility of more mistakes, more calamitous mistakes, than any other class of men. There is no doubt about it. There are countless instances of disease and calamitous illness as the result of the ill-judged dental services rendered. If a surgical operation is performed after a hearty meal the digestive action is arrested; that means something serious. A few years ago there was announced a most wonderful discovery through which the average length of male human life might be prolonged. By an-

other operation female life may be greatly prolonged. But, to enjoy long life, what is more important than mastication? There is nothing like having a great big head and plenty of elbow-grease.

DR. W. E. WALKER, Pass Christian, Miss.: I have been much surprised to hear the last speaker say that the medical profession is assailing the doctrine of reflex action. I hope the gentleman referred to a very limited portion of the profession as advancing that idea. I have been somewhat closely associated with medical men during the past winter, but I have not heard that theory advanced or the doctrine of reflex action assailed. Neither do I see why the gentleman from Nashville makes an exception of the eyeball in reflex neuroses from the trigeminus. I have in my hand the 1897 edition of Gray's "Anatomy." In four cuts, pages 795, 796, 798, and 800, we see that the ganglion in the back part of the orbit, known as lenticular or ophthalmic, has two roots; the first from the motor-oculi, and second from the nasal branch of the ophthalmic division of the fifth nerve; and that the ciliary nerves arise from this ophthalmic ganglion; the distribution of the ciliary nerves is given as "to ciliary muscle and iris." Again, turning to pages 894 and 895, the distribution is beautifully shown in the ciliary muscle and the iris, thus connecting the iris with the Gasserian ganglion.

DR. J. A. CHAPPLE: To refresh the memories of some present, I will state that Professor Garretson made the broad proposition that nine-tenths of all neuralgias and other diseases of the human head were due to diseased teeth, and, as Dr. Walker has observed, the eye made no exception as the victim of reflex neuroses. The eye suffers greatly. My experience (though my opportunities for observation have been limited) is that the victim of neuralgic lesions owes them to dental lesions. We should be very careful in our examinations before pronouncing as to the cause. I have in mind a lady who was suffering from severe pain in front of the left ear. She went to Dr. Calhoun, of our city, who sent her to me for examination of her teeth. Her molars had been beautifully filled by Dr. Eubank and Dr. Knapp, and I saw no reason for disturbing the fillings, as these were apparently not deep,—mere sulcus fissures; but, as she could obtain no relief, on the second day I removed one of the molar fillings and found the pulp in a dying condition. I removed the pulp and put in a temporary cement

filling, and relief was almost immediate, though there had been nothing to point to the tooth as the source of the excruciating pain in front of the ear. The filling was not deep, but the nerve was semi-crystallized.

DR. B. HOLLY SMITH: Numerous cases have fallen under my observation, in persons of neurotic tendency, where the climax has been developed in connection with diseased teeth. The intellectual balance is very delicate, and very slight peripheral irritation may disturb that balance. At my college the dean once sent me to see a young man whose tooth had been broken off in the infirmary three days before. The parents threatened a suit for malpractice, as the boy had been "mad" ever since the accident. I found him a raving maniac, and only by giving him chloroform could I make an examination. I found the root of a second bicuspid remaining, which I removed, and the patient made a rapid recovery. Secondary trouble developed, however, and he became a patient of mine. I operated for him free of charge, on the same principle that railroad men will provide coffin and carriages for the funeral of a man killed on the track. Anything to avoid a suit for damages. Whenever he had any dental trouble he had also deranged mentality.

In another case I was sent for to visit the daughter of a certain dignitary of the church, who was suffering from an erupting wisdom tooth. They said she was not in strong health, but I found she was suffering from a disordered mind. I was asked if I thought it possible that the erupting tooth could have that result. I visited her at a private sanitarium. I found it very difficult to get her to open her mouth, but when I succeeded I saw there was pus at the margins of the gum, and that the pulp of the tooth was destroyed, the tooth being held down so tightly that it had been strangulated. I insisted on the removal of the tooth, and two weeks later she had recovered a sound mind. She remained, however, subject to recurring attacks of insanity in connection with trouble with her teeth. On one occasion, when in Europe, she went to a dentist in Germany, who inserted an oxyphosphate filling in close proximity to the pulp. She again became insane, and her father brought her home and placed her in a sanitarium. Remembering the former result of my treatment for dental trouble, he told me what had been done in her mouth. I removed the fill-

ing and found the pulp dying, possibly from the phosphoric acid of the filling. I removed the pulp, and the patient recovered promptly. From that time on she came to see me five or six times a year. There devolved upon me the responsibility of keeping that patient free from insanity. I have had another similar case. It is not possible to put too great emphasis upon this point, that the mental condition of the inmates of our asylums and poor-houses may be greatly relieved by proper attention to the dental organs.

THE CHAIR: What was the character, or the condition, of the patient between those attacks?

DR. B. H. SMITH: She was a giant in intellect; a writer of great force; interested in political economy and other subjects demanding a broad intellectual grasp.

DR. CHAPPLE: Had there been any insanity in the family?

DR. B. H. SMITH: Yes, on the mother's side. But I cannot indicate the patient any more clearly, as the father was a very prominent man.

DR. FRANK WOODBURY, Halifax, N. S., being invited to take part in the discussion, said that a similar instance had fallen under his observation. He was called upon to visit a young man at his home, and found him far from sane. He found his teeth considerably decayed, and a number of them very loose and exuding pus. He succeeded in putting his mouth in fairly comfortable condition, and the man became a good citizen. He was a cabinet-maker, and for two years gave no signs of insanity; and then it became necessary to place him in an asylum. Attention to his teeth again restored his mind, and the conditions remain the same. When his teeth are in good condition his mind is sound; when a nerve becomes exposed he becomes insane. When his teeth and mind are sound he works at his trade, and is apparently in sound health. There is no doubt of the connection between the condition of the teeth and of the mind in these cases, and I feel no doubt but that the services of the dental surgeon would restore many of the inmates of our insane asylums to their families.

(Dr. Walker in the chair.)

DR. E. P. BEADLES, Danville, Va.; I can only account for the indifference to this very interesting subject by the fact that the medical profession as a rule regard the teeth as organs having nothing whatever to do with the rest of the human system. The

patient suffering from dyspepsia, indigestion, etc., is never questioned as to the condition of his masticating organs. A physician was speaking to me of a very obstinate case of dyspepsia. I asked him what was the condition of the teeth. He said he did not know; he had never thought about it. He asked me to examine the patient's mouth. I found that he had no means whatever of masticating his food. I pointed it out to the physician, and he ordered the patient to go and have his teeth fixed at once. I put him in some bridges, and he has been in better health than in years before. Some years ago Dr. Ottolengui, now editor of *Items of Interest*, wrote to a great many dentists asking them to give the record of cases within their knowledge of the connection between insanity and diseased teeth. He received quite a number of replies. One, however, said that he did not know of any insane from neglect of the teeth, but he did know of a case from having fillings put in.

DR. T. P. HINMAN, Atlanta, Ga.: Tissues which are associated in their development are undoubtedly associated also in diseased conditions. Thus the teeth and the internal ear are both developed from an evolution of the epiblastic layer; hence the connection between diseased molars and earache, and abscess of the ear. A young man of twenty came to me with toothache, and also an abscess in the ear. I found exposed nerves in the first, second, and third inferior molars. I removed the pulps, and the abscess gave no further trouble. I repeat, that tissues which are associated in development are also associated in diseased conditions.

DR. H. H. JOHNSON: I thank you for the points brought out in the discussion, illustrating the object I had in view in writing the paper. I believe that it will add force to the efforts being made to secure the services of dental surgery for the unfortunate inmates of our asylums for the insane.

Committee on Appliances and Improvements.

REPORT BY JNO. R. BEACH, CHAIRMAN.

I HAVE been in communication with manufacturers and others interested for weeks in regard to collecting new appliances for the Association, but have failed to obtain anything in hand of interest. I would mention Dr. W. H. Colgrove's Cavity Lining as a very good lining to be used previous to filling a tooth with gutta-percha especially. It is also used before filling with gold or amalgam. Dr. Colgrove's address is No. 11 S. Market street, Johnstown, N. Y.

Below you will find a list of new appliances on exhibition by The S. S. White Dental Mfg. Co., and they have kindly offered any of said appliances to be used by our Committee. I suggest that you get one of the Committeemen to act as chairman, and by the aid of any other he may select pick out such appliances as they may think of interest to the Association and report the same. Committee is composed of Dr. W. E. Everett, Raleigh, N. C.; Dr. Joseph Baur, New Orleans, La.; Dr. G. S. Staples, Sherman, Tex.; Dr. J. J. Sarrazin, New Orleans, La.

If you will kindly ask one of the Committee, or, if none are present, any one you may select, to attend to this for me, I shall appreciate it very much. Trusting the meeting may be a grand success, I beg to remain,

Yours very truly,

JNO. R. BEACH.

LIST OF NEW APPLIANCES ON EXHIBIT BY THE S. S. WHITE DENTAL MFG. CO.

Gardiner's Gold Trimmers, Standard Teeth-Shade Guides. Barker's Set of Hand-Pressure Instruments, Improved Gates-Glid-

den Drills, Mechanical Forceps No. 11, Rolled Gold Platinum Foil, Drill Extractors, Plate Shears for Crown- and Bridge-Work, Dr. Gordon White's Thin Burnishers, "Common Sense" Forceps No. 263 (Reeves), Duplex-Lift Chair, Unique Lathe and Chucks, Goldsmith's Thin R. L. Burnishers, Interdental Space Guards, Cup-Shaped Diamond Disk Nos. 1 and 1, Sharp's Dental Mirror, Plate and Wire Guides, and a few others.

SUPPLEMENTAL REPORT BY DR. J. J. SARRAZIN, MEMBER OF COMMITTEE ON APPLIANCES AND IMPROVEMENTS.

Appliances: Hatch's Cervical Clamp, made by the Boston Dental Mfg. Co. Most effective for crowding away gum and freely exposing gingival margins. Gives most access, filling with least amount of pain.

Improvements: All ordinary separating rubber discarded because too irritating to socket membranes. Single thickness smallest available red or black rubber tubing about one-fortieth inch thick, forty-eight or seventy-two hours, followed by gradual wooden wedges at same interval, will more slowly, but with perfect comfort, move apart crowded teeth to any desired distance. First spread is the greatest irritant, hence very thin rubber start and resulting comfort.

Matrix leaving filling built to perfect shape: Composition silver strip fitted around tooth and soldered with soft solder. Slip back to place, burnish on cervical edge, and adapt close to concavity at approximal neck of tooth. Pack gutta-percha where thus adapted at gum only. Now burnish out matrix from cavity to shape and contour of belly desired. Pack gutta-percha in between matrix and adjoining tooth and all around space between the teeth. Filling, after insertion, will require no shaping and very little polishing. Gutta-percha yields just enough to insure perfect margins when thus backing composition silver strip. For amalgam, instead of soft soldering, stick silver strip with hard adhesive wax for ease of removal by warming without disturbing amalgam. Proceed as above for cervical margin and contour. Use amalgam as hard and dry as desired.

Except Hatch's Clamp and Silver Strip Magill Band, all other suggestions original. S.

DISCUSSION.

DR. W. E. WALKER: A serious objection to the electric plugger and the Bonwill electric mallet is that there is no rest for the hand. We have to use the thumb of the left hand to support and steady the piece, and for that reason some men have given up their use. I find that I can entirely overcome this difficulty by using, in a specially constructed socket, the very short points made for the Bosworth automatic mallet. They are so short that all vibration is prevented. Unless a special socket is made, it is necessary to wrap the shank to make them fit the socket of the electric plugger, but The S. S. White Co. will make a socket which will take the Bosworth points. They are also making for me some Parmly Brown points of the same length as the Bosworth points.

DR. CHAPPLE: I have often wondered why we did not have such a combination, but it had not occurred to me how to overcome the difficulty.

DR. WALKER: I have also here a little wire device for holding the electrode steady in cataphoresis. It is different from anything on the market, and I find it very reliable.

Hygienic and Esthetic Crown.

PAPER BY WM. ERNEST WALKER, D.D.S., PASS CHRISTIAN, MISS.*

IN the latest edition of Evans's "Crown- and Bridge-Work" Dr. Hollingsworth is given credit for a method of mounting the Logan crown with metallic base and a band around the outside of the root. There is also described the Simplicity crown, which requires concaving the end of the root, in which a circular groove is then cut, in which amalgam is packed, making in reality an interior band of amalgam. I have used this method with the substitution, however, of a gold band in place of the amalgam, which gives much greater strength, the concave end of the root being filled with solder flowed over a thin disk of gold or platinum. The most satisfactory crown in every sense—hygienic, esthetic, easy to adjust, and comfortable to the patient—that I have used is a combination of this interior band and the Hollingsworth method of mounting the Logan crown. My method may be described as follows: The end of the root is to be squared off and beveled a little beneath the gum at the labial aspect. The canal is reamed, and a Logan crown selected with a periphery corresponding with that of the root. The crown is ground to a fair joint at the labial margin and beveled upward to the lingual surface, which should be ground so as to leave a space of about the sixteenth of an inch between the porcelain and the root,—a wedge-shaped space of which the apex is toward the labial aspect of the tooth. A circumferent groove is next cut in the end of the root, between the canal and the periphery, but nearer the latter. In this groove a band of 22 carat, No. 28 gauge gold is fitted, which should be wide enough to project sufficiently from the groove to afford a

*Professor of Operative Dentistry, University College of Medicine, Richmond, Va.

good hold for removal. When fitted, the band in position in the groove is scratch-marked all around at the level of the root end, and ground down even with the surface of the root, except at one or two points, where tongues are left by which to remove the band from the groove. The grinding or filing can be done either in or out of the mouth; in the latter case guided by the scratch-mark previously made. The tongues are then ground off, and, the band being reversed, the side which presented while on the root is turned down on a thin piece of gold or platinum laid in the palm of the hand, which, if well annealed, will adapt itself closely to the ground edge of the band when the latter is pressed down upon it. The plate with the band in position is then grasped with a delicate pair of tweezers, and, with the addition of a little flux, solder, and flame, the two are made one.

The plate is then trimmed approximately to the size of the root, placed in position with the band entering the groove, and the plate burnished to the face of the root, outlining the periphery and the mouth of the root-canal. The piece is again removed and the plate trimmed to the size and shape of the periphery, as indicated by the burnishing, and a hole punched or drilled at the point indicating the entrance to the canal to admit the pin of the Logan crown previously prepared as described. A piece of 24 carat gold is next perforated for the passage of the Logan pin, and adapted to the beveled base of the porcelain. The pin is then surrounded by a mass of Parr's fluxed wax, the plate with the band placed on the root and reburnished and warmed by throwing a current of hot air on it. The porcelain is next warmed and placed in position, the warmth causing the fluxed wax, which now fills the wedge-shaped space, to adhere to both plates, so that when cooled all can come off together. When cool remove, trim away surplus wax, and invest, for which purpose Brown's "Investment Fiber" serves admirably; when mixed with alcohol the latter can be ignited, drying out the investment while you get your solder ready. Eighteen or 20 carat gold solder is now flowed into the space between the two surfaces of gold. Although I have heated many Logan crowns in investment, I have never had one cracked, or even checked, as far as I could see. I am, however, careful to heat the porcelain before heating the pin. This crown offers the advantage of a band for strength, combined with the beauty and strength of

the Logan crown. It obviates the necessity of a band on the outside of the root, the construction of which, if properly made, would take even longer than this method; while, unfortunately, it frequently happens that external bands do not fit smoothly, it being so difficult, disagreeable, and sometimes even painful to the patient to give the outer surface of the root such a shape as will permit a smoothly-fitting band. The band, being within the structure of the root, is out of sight (no slang intended), and cannot irritate the tissues; and there is no gold to be exposed in case of recession of the gums. Having used and taught this method of constructing a crown during the past eighteen months, and not finding it described in Evans's "Crown- and Bridge-Work" or in the "American Text-Book of Prosthetic Dentistry," and being desirous of giving credit to whom credit is due, I have been recently looking through the older dental journals. As far as I have learned, the groove in the face of the root, between the canal and the periphery, for the reception of a band, was first described and shown at a clinic of the First District Dental Society of New York, December 3, 1888,* by Mr. H. F. Maasch, then a student of the New York College of Dentistry, and who died a little more than a year ago.

The Maasch crown is more fully described, and the prepared roots and instruments used illustrated, in the *Dental Cosmos* of March, 1889 (page 233), where a root with two canals is shown prepared witn two grooves to receive a crown with two pins. In the *Dental Cosmos*, April, 1892, a root similarly grooved, with band in position, is shown as Dr. D. R. Jennings's modification of the Maasch method. The band was allowed to project above the surface of the root-face all around, to enter the hollow space in the base of the crown, no disk being interposed between the root and the porcelain. At the meeting of the Alabama State Dental Association in 1894 Dr. J. H. Crossland (Montgomery) described and showed specimens of what was substantially the Maasch crown, although original with Dr. Crossland. He used what he termed an "inner band" set in a groove, with a plate tooth backed with gold, and a platinum pin, making a porcelain-faced crown. He also suggested making the band and cap of platinum, and baking in a porcelain backing. The wedge-shaped section of gold between the crown and root is a modification of Dr. Gordon White's method

*Reported by Dr. M. L. Rhein. *Dental Cosmos*, February, 1889.

of adjusting the Logan crown,* with the addition of the inner band, or of the Hollingsworth method, with an inner instead of an external band. Thus, while the method I have described is, as a whole, a novelty, its special features are all modifications of ideas which are old. But we were told many years ago that "there is nothing new under the sun." The merits I claim for it are that it is hygienic, esthetic, strong, easy to construct and to adjust,—is adjusted with the minimum amount of discomfort to the patient.

DISCUSSION.

DR. L. M. COWARDIN: For a crown with a band this appeals to me as the best I have ever heard of. The band extending beneath the gum I consider the bane of crowning. They are ruinous, and cause far more harm than the root-splitting which is the only pretext for their use. Far more roots have been lost as the result of the use of a band than from not having a band. I long since abandoned any attempt to band a root. I use the English tube crown as the best means of crowning single-rooted teeth. The tubes are always of the same size, and are easily removed if a crown breaks. With a band inserted in a groove in the face of the root, it is not even essential to cement on the crown. I am very glad to hear of this method, because there are sometimes cases where we do need a band but do not use one for fear of injury to the gingival margin.

THE CHAIR: I have known that you use the English tube teeth, and would be glad to learn something about them.

DR. COWARDIN: I have very few methods that I can call my own, but as far as I can I will answer your question. Some years ago I had engaged to make a set of teeth for a gentleman. I found teeth of the proper size and color, but it was necessary to alter their shape; and I found it difficult to do it to the extent necessary without impairing the polish, which I could not restore. I had read of the English tube crowns in an old edition of Harris, and I wrote to Ash & Co., of New York. They sent me down a miscellaneous assortment to select from. I at once saw the advantages they offered for crown- and bridge-work. There is a tube which is inserted in the root, and a half-round pin which, when inserted in the tube, will not allow the crown to twist around. The pin is of

Dental Cosmos, January, 1893.

iridium and platinum, and is cemented into the tube; the crown, being slipped on, goes to the same position every time. You can get a very close adaptation to the face of the root; I do not know of any other crown with which you can get such close approximation. Then you can grind them just as much as you please, as they are of the same texture and the same color all the way through, and take a fine polish on the ground surface. In my section of country nearly all the dentists use them. You can get exactly what you want, because you can grind them to suit the case. They come in bicuspids, cuspids, and anterior teeth.

DR. CRAWFORD: I do not like to take up so much of your time, but I have been working all my life to put down wrong doctrines. If your teachings [to Dr. Cowardin] were accepted I should go all to pieces. I am very much obliged to the gentleman for his carefully written technical description of what he calls a hygienic crown, but it won't do. Dr. Cowardin does violence to one of the most beautiful, most prominent, most successful operations,—the collar crown. Dr. Cowardin sits down on the collar crown. I say that from the standpoint of prosthetics, of durability, of beauty, the Richmond crown stands at the head of the list. [Dr. Beadles: Except when it splits off.] It is dangerous doctrine. When you talk that way, Brother Cowardin, you hurt dental surgery. We not only put on a collar to protect the root from splitting, but to give the abutment greater strength.

One of the greatest dentists who ever taught in private or in public was fond of using plugs in the teeth to support bridges. But it is hard enough to make plugs stay in the teeth anyway, without putting levers into them. A bridge with no other support than a post in a root at each end will soon work loose.

DR. COWARDIN: I am willing to have what I have said go out to the world as my creed. I have seen something of collar crowns, and they cannot be made hygienic. I have yet to see the first one that did not leave some traces of injury; there are never the same conditions at the gingival margins as around the other teeth. I know that a collar injures the tooth and the surrounding tissues.

DR. CRAWFORD: A good collar crown, with porcelain face, on a single-rooted tooth is as far superior to a crown with a metal post as a good metal pivot is ahead of the old-fashioned wooden peg pivot.

DR. COWARDIN: What about the gold showing?

DR. CRAWFORD: Let it show!

DR. COWARDIN: Is that esthetic?

DR. CRAWFORD: More so than no tooth at all, which will be the result in the end if the crown has no collar. The root will disintegrate sooner or later if the joint is exposed to the fluids of the mouth. Cover up that joint between the root and the crown, and keep out the bacteria and all the other little devils you bacteriologists talk about. Take the measure and make your collar; if it don't fit make another, and keep on till you get one that does fit so that it will keep out the serum of the blood; then you've got a pretty good joint.

DR. FRANK HOLLAND: I have never seen a banded tooth—one of the six anterior teeth (and I want this to go on record)—that was clean and the tissues healthy around it. If you make it thick enough to have the requisite strength it will irritate the tissues, and the accumulations around it will make it objectionable both to the patient and to others. I have seen teeth that were banded by the best operators, but I never saw one that was as clean and healthy around the gum-margins as an unbanded natural tooth. I try to be charitable, but I say it is an impossibility. In all our operations we should approximate nature as closely as possible. Nature will not tolerate any interference with the gum-margins; it is on a par with the old style of separating the teeth, leaving flat surfaces to come together without any knuckle,—the surest invitation to bacteria and decay. To get down to an absolutely correct basis, the highest order of dentistry is the closest approximation to nature. A crown may be stronger on a banded root, but strength alone does not compensate for the objectionable features. Whenever you get away from nature, or try to add to it, you are inviting disaster. It is not good dentistry.

DR. C. L. ALEXANDER: I think Dr. Holland has taken decidedly the most sensible stand on this point that I have ever heard advocated. If I understood Dr. Walker correctly, he cuts a groove in the face of the root. Do you not find that difficult in some cases?

DR. WALKER: I do not claim that this method is of universal application. Its usefulness is circumscribed. There are some roots that are too small to admit of a band between the root-canal

and the periphery; there are others that are too concaved by decay to afford space for the groove; but, under proper conditions, it will be found a valuable method.

DR. ALEXANDER: I see that there are cases in which it would serve very nicely. But I have shown specimens to-day of a method more generally practicable than the one just described, by using two, three, or four very small additional pins. Dr. Cowardin says the Bonwill and Logan crowns cannot be adjusted as accurately as the English tube teeth, but to my mind the Logan can be made to fit perfectly, as far as the use of that word is justifiable.

DR. COWARDIN: When it is necessary to reduce a Logan crown it cannot be ground down to a joint and then repolished, like the English tube teeth. You can grind it, but you cannot restore the polished surface.

DR. ALEXANDER: It can be done, but not in the old way. If the Logan crown is provided with additional pins to enter the face of the root, you get a very clean and practical crown.

DR. COWARDIN: I object to the interposition of a plate of metal between the crown and the root. The English tube tooth can be so perfectly adapted, in apposition to the face of the root, that, with its half-round pin, it must always go into exactly the same position.

DR. ALEXANDER: As to banding a root, I have abandoned that altogether. I never saw one, whether of my own or others, that was healthy and clean.

DR. CRAWFORD: Mr. President, I have nothing at stake in this matter at all. I don't care anything about it personally, but the smaller the number of dentists who put on collar crowns the better it is for me, for I will get all the more to do. Attention has been called to the space that we would see between the band and the root, if one would look at it from the other end and see how the band stands away from the root at its lower edge. Yes; I know how they stand off, but we are improving along that line. I know they don't always fit as we want them to, but we are going to keep on improving. We can't afford to go back on the collar crown. That would not be making progress, and I still maintain that there are more failures without a collar than with one. Dr. Holland says the less cement used the better, but don't we know that a large

cement filling lasts longer than a small one? Without a collar the cement is right at the margin, where it will melt out. As to the quantity of cement between the porcelain and the stump, there is a space about equal to the thickness of the finest tissue paper that is filled with thin cement; but when the cement has washed out that space is left, and your root is lost. Your work would be more durable if you could use a larger amount of cement. That is why some of the best crowns—the Logan crown—have a countersink to increase the quantity of cement at the vulnerable point. The collar crown seems to need an advocate here, and I stand up for it; it is one of the best things in modern prosthetic dentistry. Now, gentlemen, Brother Cowardin, Brother Holland, you may be dead sure I am right in my advocacy of the collar crown as the best crown when properly constructed.

DR. ALEXANDER: But when you can avoid a band, do it.

DR. COWARDIN: That is, when you can avoid putting on a crown, do it.

DR. H. H. JOHNSON: For a long time I thought that the only crowns that could be a success in every way were those in which the root was banded. But I began to find out that the bands were a source of irritation to the gum; that the gum receded, and the band became more exposed. I thought that it was perhaps because they were not properly constructed, not a proper fit, but I found that it was the result not only with my own crowns, but it was the same with those of others; and I now use very few collars. Of course, we must use them sometimes. When there is a bridge of any length it is necessary at the abutments. But they must be properly made and correctly fitted. As we look down upon the root from the gum-margin the slope is the wrong way, and requires to be beveled to proper shape to receive a band that will not stand off, but must be annealed and burnished down to a close fit. The object of the band is not so much to give strength as to protect the cement and keep it from washing out. By proceeding carefully a close adaptation can be secured without much pain to the patient. One point not brought out is that of making the pin too short. If you want to split a block that has a hole bored in it, and you put a lever in the hole to pry it open, you don't put it straight down to the bottom of the hole. You bear down on the edge. So, if you don't want to split your root, don't use a short pin, which would

act as a lever, but have it as long as possible; that will prevent leverage and splitting the root.

THE CHAIR: I wish to thank the speaker for that point. I had not thought of that principle in mechanics before.

DR. A. A. PEARSON: I stand beside Dr. Crawford for the banded crown. In my hands it is better than any other. As to the point Dr. Johnson brought out, I always put the pin down as long as possible. I saw the Logan crown that Dr. Alexander exhibited to-day, and like it better than anything that I have seen, and I propose to test it. But until I do that I shall adhere to the collar crown. I have one in my own mouth that I have worn for twelve years, and I know there is no recession of the gums, and no odor if my mouth is kept clean. It is not necessary to have a collar crown to create an odor if the mouth is not kept clean.

DR. FRANK HOLLAND: Did you ever see a banded crown on one of the six anterior teeth that was perfectly healthy around the gum-margin? I have not seen one in fifteen years, and I have seen a good many of them in that time. And during the same time I have seen a good many crowns that were not banded that were almost perfect, with no filthy accumulations after meals. I have not had the opportunity of making the same comparison as to durability, but I am quite sure of the durability of any crowns that are not banded. I have taken off many banded crowns because of gingivitis. They are never healthy, and I doubt if they are as durable.

DR. B. H. SMITH: I will give you an idea that has not been brought out. If your tooth has a good lingual wall, cut it off so that the porcelain fits at the labial aspect under the free margin of the gum, but let the tooth stand high lingually; that gives additional purchase, and is an advantage. As to banding the root, the band is objectionable if improperly adjusted; but it is possible to so adjust a band that it will be reasonably healthy. The objectionable feature is carrying it too high. I was taught to carry the band well up under the free margin as far as I could without injury. But it is apt to induce inflammation if carried too high up under the gum-margin.

DR. WALKER: Mr. President, we should be guarded against becoming extremists, for danger lies that way. We have had examples of this to-night on both sides. As to the crown spoken of by the gentleman from Tennessee as *the most perfect crown*, I do

not see how he can make that claim for it, as the porcelain face is so liable to split off. The additional pins suggested by Dr. Alexander is a good feature, and makes a crown that is easily repaired. I prefer the methods he has taught us before to the one advocated this year. Trimming the end of the root convex is a method of somewhat limited application. There is not always enough sound tooth-substance to give that mound in the center, but I propose to try it, as I think it would be very nice in some cases. While the gentleman from Nashville has gone to one extreme, I think our friend from Atlanta has also gone to the extreme in the other direction, for I am sure I have seen some anterior teeth that were banded and healthy. If the posterior teeth can be banded, and this has not been disputed, why cannot an anterior tooth also be banded and be equally healthy? I admit that it is difficult, but it can be done so that the edge of the band is as smooth with the surface of the root as the edge of a filling. When it is not properly done it is, of course, a source of irritation, but, as we must have them to strengthen bridge-work, we must learn to make them properly. I do not believe that there can be a more perfect adaptation than that of the Logan crown if we use Kirk's method with articulating paper.

DR. HOLLAND: I did not mean to be understood as saying that posterior teeth, when banded, were healthy either. They are not, any more than are the front teeth. But we cannot avoid the use of bands for the posterior teeth.

DR. WALKER: Then I say that if you really believe that bands are as bad as you say you have no right to put one on any tooth, either anterior or posterior.

DR. B. HOLLY SMITH: As Dr. Cowardin has told you to-night, use the English tube teeth.

DR. WALKER: Dr. Cowardin has not told us how to use the English tube teeth he speaks so highly of.

DR. COWARDIN: There is not time to-night, but it is not necessary to band a molar tooth. If it is scooped out by decay, go to healthy tissue, and then with amalgam build it up again to the proper shape, and put a cap over that.

DR. WALKER: I would ask Dr. Holland why he would not use a Logan crown on the posterior teeth.

DR. HOLLAND: Because it is beyond the power of man to make

a perfect joint. You can't grind a Logan crown to the anterior teeth in many cases without interposing a burnished plate of metal.

DR. WALKER: Yes, sir.

DR. HOLLAND: I don't believe a Logan crown was ever perfectly adapted to the face of the root.

DR. WALKER: If you would try Dr. Kirk's method, you can use the Logan crown as perfectly in the back of the mouth as in the front. It is difficult because inaccessible, but it can be done by using Dr. Kirk's method. Of course, to say that a band does not strengthen a root is the same as saying that a ferrule doesn't strengthen a cane. If a cane is broken and you put a pin in, passing from one piece to the other, it makes a joint; but one side or the other is liable to split, and you put a band around it to keep it from splitting. That is as simple as the point that Dr. Johnson brought out.

DR. QUATTLEBAUM: Did you ever see a banded root split?

DR. HOLLAND: I have seen dozens of them split.

DR. WALKER: It was because I desired to have the strength of the band and at the same time the hygienic advantages of no band that I devised the crown I have described. By this method you leave the enamel untouched, and avoid the tedious, unpleasant process of shaping the root for the reception of a band.

THE CHAIR: We would like to hear from Dr. Ewing Smith on this subject.

DR. S. EWING SMITH: I have been quite a bridge-builder, and I have made crowns, I believe, of every kind ever originated in the brain of man. And I have seen a great many failures in almost every kind. I will cite one case to illustrate a point I wish to make; that is a Logan crown on a split root. The crown had been set and reset eleven times. When the case came to me the root was in two entirely separate pieces. I drew the two pieces of the root closely together and banded it solidly. Then I put on a Richmond crown, and it has been worn successfully for several years now, and has never bothered him at all. In such a case as that a banded crown was the only possible thing to hold the pieces of the root together. I am like Dr. Walker; we should not go to extremes. For a band to be successful the root must be so trimmed that it will be larger as you go from the surface, so that the farther you drive it on the tighter it will fit. Be careful not to

drive it too far up, but be sure you have a perfect fit and reduce the band to a feather-edge finish with the surface of the tooth; then you are sure to have a perfect fit with no offset at the other end. As Dr. Crawford said, you can tell when you have a perfect adaptation without having to go to the apex and look back at it. With such a band there is no place for the lodgment of bacteria. To accomplish this you have got to be a good mechanic; work carefully; don't hurry, and when you get a band on as I have described it you will have a good piece of work. I have made some of Dr. Alexander's crowns, and like his methods. As a rule I do not favor the Richmond crown. It lacks strength, and there are others that are better in point of cleanliness and perfection of fit.

DR. CRAWFORD: There is one of our members who has said nothing on this subject. I would like to have an expression of opinion from Dr. Simpson on the question of collar or no collar.

DR. I. SIMPSON: So much has been said on this subject that I will only say that as far as my experience goes,—and I have put on a great many crowns,—and also judging from what I have seen, a banded crown is much better than a crown without a band.

Publication Committee.

REPORT BY DR. S. W. FOSTER, CHAIRMAN.

IN regard to the report of the last meeting, I can only say that, as usual, our reporter, Mrs. Walker, furnished the report very promptly, and it was immediately sent on to The S. S. White Company, with whom we had contracted for its publication, as had been done for several years. But they had so much other matter already on hand that I have not yet received the last of the proof sheets. I expect to have them very shortly, however, and the volume will be sent to all members, the only cost to us being the extra amount, seven cents a copy, for furnishing in cloth binding.

As we are now working under a new Constitution, some conclusion must be reached as to the publication of the Transactions of the present meeting. It seems to be the understanding of many that the report of our proceedings should be sent to the National Association, to be published in the volume of Transactions of the National Association.

DISCUSSION.

DR. CRAWFORD: I move that the Publication Committee be given plenary powers in regard to the publication of the Transactions of this meeting.

DR. B. H. SMITH: As a member of the Committee of Arrangements of the National, I can assure you that our proceedings as a branch and that our papers will be published in full in the Transactions of the National, of which we are an integral part.

Committee on Cataphoresis.

REPORT BY DR. J. L. MEWBORN, CHAIRMAN, MEMPHIS, TENN.

"It is the *dread* of pain which makes cowards of us all."

WE see this fact demonstrated every day. The scene is a familiar one. In the years of infancy and childhood, when faith is implicit and impressions lasting, we have seen the bright, fearless lad yield to the most abject appeals for mercy at the mere *mention* of having the dangling crown of a baby tooth flipped off with the finger. The stalwart man takes the chair with hands convulsively gripped, feet firmly braced, and every muscular fiber to fullest tension drawn, as if to meet the crash of worlds. At the *merest scratch* of the excavator, or the *noise* of the engine bur, great beads of perspiration are seen oozing from every pore; his blood is chilled, his marrow freezes in his bones, and he groans in mortal agony, as if soul and body were being torn asunder. These imaginary terrors drive thousands away from the dentist who suffer through life, or become toothless degenerates, and never know the comforts they have lost by not securing timely aid from the dentist. These delays widen the chasm between them and us. They dread and wait until the micrococci, bacilli, leptothrix buccalis, malaria, pyorrhea alveolaris, erosion, dyspepsia, syphilitic, scorbutic, and mercurial heredity, and all other enemies and agencies hold high carnival amid the wreck of their dental organism, after which we *may* be called on to clean out the accumulated ptomaines of this feast, waste our energies, and bankrupt our resources plastering up the detritus, which is all they have left to our monumental skill; and, after reviewing the results of our most brilliant efforts, are ready to cry out in disgust, "What's the use?"

Within fifty years many new inventions, new appliances, new im-

plements, new materials, new methods, with their train of humanizing and civilizing influences, have been brought to bear to bridge over this chasm for us. But with each advance new suspicions are aroused; the dread grows stronger and stronger; the contagion spreads, and from year to year people grow more and more averse to any operation accompanied with pain. To meet these demands and antagonize these heresies we have used everything from Christian Science up to the rabbit's foot. All these have failed.

The last, and perhaps the most hopeful yet offered to our armamentarium is *catapharesis,* not "cataphoresis." The word is from the Greek *Kata* (I write English letters) and *Pharo,* I pierce, cut, divide. It should be pronounced cat-a-phar-e-sis, accent on *phar,* which is like *fair.* It means a cutting or piercing through,—the method for treating a supersensitive tooth so that decay can be removed without pain. A pellet of cotton saturated with a fifty per cent. solution of cocain is placed in the cavity after the tooth has been thoroughly insulated, a current of electricity is passed through it for an *indefinite* time, when the sensitiveness will be destroyed.

How is this result accomplished? If it is not done by a cutting or piercing through of the dentin to the nerve-fibrils, then it is not cataphoresis. If the walls of the dentinal tubuli are broken down by chemical action, so that the cocain may reach and paralyze the nerve-fibrils, then it *is* electrolysis. If there is no chemical destruction of tooth-substance, but the result of a modified condition of living matter, or nerve-fibrils, produced by the accelerated endosmotic action of a constant current of electricity, loaded with cocain, then it is electrotonesis. This is undoubtedly the correct exegesis of the process. A great many outfits manufactured for this purpose and offered to the profession are practically worthless. How, then, can those who know nothing of the relative merits of different makes determine which to buy? The gross amount of money involved to the dental profession in this transaction would justify the most thorough investigation. To this end I have invited a number of the manufacturers of the leading cataphoric outfits to have their machines represented here by an agent capable of demonstrating its merits in a competitive test. I have urged the Chairman of Clinics and the local Committee of Arrangements to use their best efforts to secure an abundant

supply of clinical material,—patients with discolored teeth to be bleached, with living nerves to be removed, supersensitive teeth to be rendered painless for filling, etc. Immediately after the appointment of committees I wrote to each member, urging him to furnish a paper; but, fearing to rely on them entirely, and since I knew absolutely nothing of cataphoresis myself, having never used it nor seen it used, I determined to present to you the experience and opinions of those who had used it. For this purpose I had printed on one hundred return answer postal cards this note:

"DEAR DOCTOR: In order to make a full report at the February meeting of the Southern Dental Association as to the practical results of cataphoresis in dental operations, will you kindly give your *candid* opinion, naming conditions and reasons for and against its use? What apparatus have you used? Give your opinion as to its merits."

These I mailed to those who I knew were using catapharesis, and to leading dentists over the United States. I received about thirty replies, which I will give you as short papers for discussion:

DR. S. B. COOK, Chattanooga, Tenn.: "I have never used it; not sufficient faith to invest. Have never seen any man claim it a success in all cases; too much uncertainty for time required."

DR. B. H. CATCHING, Atlanta, Ga.: "Have used it successfully and unsuccessfully. Think with judgment it is good."

DR. C. N. PEIRCE, Philadelphia: "Do not use it; not impressed with its reliability in others' hands."

DR. GORDON WHITE, Nashville, Tenn.: "Have not used it yet, but am a close observer; in some cases, and for some patients, it is a success, in others a failure; do not believe everything claimed by its enthusiastic supporters."

DR. L. A. KING, Anderson, Ky.: "Have used it almost daily for fourteen months; always find it serviceable. Have amputated crown of sound tooth painlessly; think it indispensable; use the 'Werner.'"

DR. J. TAFT, Cincinnati, O.: "Will endeavor to comply by the 30th instant; will not have much to say."

DR. H. E. BEACH, Clarksville, Tenn.: "A valuable adjunct to dentistry; supersensitive teeth properly insulated made painless; exposed pulps removed without pain and filled at one sitting; a tooth being insensible to pain, danger of after-trouble from too near approach to pulp; use the Werner, but do not think it is, at all times, reliable as to current; it has come to stay."

DR. L. P. DOTTERER, Charleston, S. C.: "Have not used it; observation does not justify my investing, as I have not the time to run it, nor the cheek to charge more for it."

DR. W. H. PITCHER, Paducah, Ky.: "Have used the Baltimore dry-

cell outfit for a year and a half; record of first fifteen cases, every one successful; one of the greatest helpers to the dentist invented in recent years; no up-to-date dentist should be without it; don't consider a rheostat much good, on account of unsteadiness of current; dry cell more even."

DR. G. S. PEARCY, Jackson, Tenn.: "Very unsatisfactory in my hands; too much loss of time to secure desired results; in some cases no good at all; used the 'Werner,' but have thrown it aside some time ago."

DR. M. M. HALTOM, Ripley, Tenn.: "Am using the 'Dow' portable dry cell; it does not come up to the claims of the maker; have performed some satisfactory operations by consuming more time than I care to take; this is its greatest objection."

ARRINGTON & ARRINGTON, Memphis, Tenn.: "We have used three different instruments, and after careful application, in strict accordance with the makers' instructions, we find them failures as obtunders of dentin; but in connection with a twenty-five per cent. solution of pyrozone for bleaching teeth, and for extirpating live nerves, very satisfactory. Our best results from the 'Chlorid Silver Battery.'"

DR. E. P. BEADLES, Danville, Va.: "Have had too little experience, or would send you something."

DR. B. D. BRABSON, Knoxville, Tenn.: "My experience unsatisfactory; takes up too much valuable time, then may fail. I use Van Woert's instrument."

DR. J. T. CREWS, Humboldt, Tenn.: "Do not use it, but from observation, and personal experience as a subject in a recent clinic, I consider the discovery a misfortune at present, but hope the future will make it a success."

DR. A. F. CLAYWELL, Lebanon, Tenn.: "In many cases I find it almost indispensable, as the excavating could not be properly done without it; would use it more but for the time consumed. I use the 'Werner battery.'"

DR. J. M. GLENN, Trenton, Tenn.: "With good access to the cavity, and give it plenty of time, I get fairly good results; have used the 'Werner' and the 'chlorid of silver dry-cell;' like the latter best; use it more for bleaching teeth than otherwise; have almost abandoned it for obtunding sensitive dentin; consumes too much time."

DR. B. S. DUDLEY, Grenada, Miss.: "Find great trouble with buccal cavities extending under the gum, owing to the trouble of securing thorough insulation. Find low voltage best, causing least discomfort."

DR. J. N. JONES, Jacksonville, Fla.: "Experience too limited to offer an opinion; condemn it on general principles; *candidly*, believe in less time than it required to forget 'Younger' it will be a thing of the past."

DR. J. HALL MOORE, Richmond, Va.: "For many years I have used a saturated solution of cocain and carbolic acid with hot air, for removing exposed pulps, with such satisfactory results that I don't care to experiment with so dangerous an agent as electricity in the mouths of my patients."

DR. W. D. ALLEN, Huntsville, Ala.: "Have been eminently successful, securing complete anesthesia in fifteen to thirty minutes in a great majority of cases. In a few cases the slightest current inflicts much pain. I prepare the cocain fresh each time, making it thirty to fifty per cent. Use the chlorid silver dry-cell battery."

DR. F. M. COMEGYS, Shreveport, La.: "I use the Cary Battery; objection, the time required and frequently pain to the patient; find the same objection to all other makes; rarely ever use the one I have."

DR. R. C. YOUNG, Anniston, Ala.: "I have used the McIntosh Battery about a year, obtunding sensitive dentin and removing live pulps. It is positive and reliable. Have bleached but one tooth, result satisfactory; rarely accomplish anything in less than thirty minutes, often longer; can be used by the most uninformed on the science of electricity; not necessary to know an ampere from a volt. It is necessary to understand the construction of your battery. Keep all connections clean and tight, or the current is weakened and failure results. Always disconnect electrodes when not in use; this prevents leakage by short-circuiting. In coupling up the battery and rheostat, be sure the P. P. electrode is not in the N. N. plug, which would reverse the current and accomplish nothing, but give your patient pain. Less pain is produced when a constant but exceedingly delicate movement is kept upon the rheostat; not pushing it a little, then waiting and pushing again; even the sixteenth of an inch brings the power on with a broken current, which gives considerable pain. If the rheostat could be moved by clockwork it would be a great comfort to the patient and allow the operator a chance to attend to other duties. It is absolutely necessary to have the individual tooth isolated."

D. W. T.: "When the dam is thrown over two teeth having a cavity in the approximal surface of one, and a metal filling in the other, if the cotton saturated with the cocain solution placed in the cavity is allowed to touch the metal filling, the current is shunted,—success nil! Remedy, slip a strip of mica between the teeth, or varnish the filling with chloro-percha; or a case when cavity in buccal surface of molar,—dam held on with clamp. It is impossible to keep a little of the solution from reaching the clamp, and it is wonderful how little moisture it takes to conduct a current. Here a little chloro-percha must be put on that part of the clamp nearest the cavity margin, or the current will be shunted, or deflected from the course desired. In removing live pulps, I find much time can be saved by applying the current long enough to deaden the bulbous portion so that it can be thoroughly exposed, then inject a strong solution of cocain directly into the canal, taking the precaution of fitting a piece of soft rubber around the needle large enough to fill the opening to the canal. With an instrument pressed upon this piece of rubber to prevent regurgitation, inject a few drops of cocain, which will be found sufficient to thoroughly anesthetize a full length of pulp in this root. If a multi-root, repeat the same process with each canal. Immediate root-filling may follow all extirpations. Up to the present time, I have no reason to

suppose I have caused the death of any pulp by using cataphoresis for obtunding sensitive dentin."

DR. W. M. SLACK, Memphis, Tenn.: "My experience extends back over a period of eighteen months, and has been as a whole very satisfactory; sometimes delighted, again disappointed. There is nothing to take its place in a case of pulpitis where it is impossible to wait for the action of arsenic. By its application I have succeeded in aborting abscess, even when there was considerable swelling. I am a strong advocate of cataphoresis; think it has come to stay. The time necessary to obtain good results is the great obstacle. Hope your efforts at St. Augustine will result in overcoming this objection, so that we may be enabled to get an apparatus that will give universal satisfaction."

I might have been able to submit a good many other reports from prominent dentists throughout the Northern States but for the carelessness of my printer, who omitted my address on the answer cards, so that I only received responses from those who knew my address. If this report does no other good, I hope it may serve to show manufacturers of cataphoric outfits where the greatest trouble lies and stimulate their inventive genius to remedy it. I have endeavored to have a number of instruments here on exhibition; also as far as possible to make a competitive test of their relative merits. I suggest that the President appoint a committee to take charge of this exhibit, to assign clinics for each, to take note of time and results in each case, and report to the Association.

I have the honor to accompany this report with a paper from Dr. Johnson, associate member on the Committee on Cataphoresis. All of which is respectfully submitted.

Cataphoresis.

PAPER BY H. H. JOHNSON, D.D.S., MACON, GA.

MY only excuse for writing on this subject is that I was appointed on the Committee. To write an original paper on cataphoresis at this time would be almost an impossibility; to give credit where credit is due for all the ideas advanced would be equally as difficult. I shall therefore lay claim to but few ideas herein advanced, and give due credit wherever possible.

All new things must pass through an experimental stage of anticipation, anxiety, and disappointment before reaching the level plane of practicability; cataphoresis has been no exception in this respect. It has taken much experimentation by those versed in electrical lore to bring it to a thoroughly practical stage. It has now about reached its highest development, and nothing radically new may be looked for in the future, unless it be in the improvement of the appliances for its application.

So thoroughly have its successful results been advertised and demonstrated that there is hardly any one at this time who can entertain the least possible doubt in that respect. A good instrument, a suitable case, and proper application, and satisfactory results must always follow. Just here is where many disappointments have arisen. Ignorance of the laws governing electricity, and inability thereby to select proper instruments or practicable cases, have caused many to become discouraged in the beginning of their experimentation. The vast number of impracticable cases, as well as the great consumption of time, has also been the cause of others losing their enthusiasm for it. A few suggestions might possibly be of value to some present, while to others they will probably be of no special interest.

The ideal current for cataphoresis is one with a steady, constant

flow of high voltage and low amperage in proportion. In other words, it is the force and not the quantity which is required. Open circuit batteries are the most practicable means for obtaining such a current.

A current generated by a dynamo is variable and inconstant, because its voltage depends on the number of revolutions of a machine, which may, and generally does, run irregularly to some extent. The slipping of a belt, sudden increase of power, or anything which might increase or decrease the revolutions of the dynamo, would certainly give the patient a very unpleasant shock.

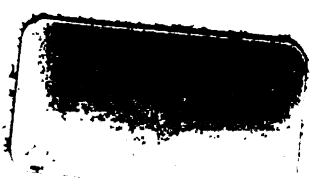
Next to a constant, steady current, the most essential thing to prevent pain and shocks is a perfect current controller, or rheostat, so that the current can be turned on very gradually, commencing at nothing and bringing it gradually up to five, ten, fifteen, or twenty volts, as the operator desires. Never allow the negative electrode, which has contact with the hand or body, or the positive electrode, which is in the tooth, to become dry, or the current will have difficulty in passing through and heat will be evolved.

A milliampere meter, while not a necessity, is always desirable, for by that means one may never be in doubt as to connections, the amount of current flowing, whether too much or too little, or whether any at all. A leakage in the insulation can easily be detected by this means, as too much current will be indicated by the needle. The next most important thing is complete insulation of the tooth. The soft tissues of the mouth are much better conductors than the tooth, and the current will always pass through the medium of less resistance. Moisture about the parts will conduct the current away, or probably be the means of forming a connection with a steel rubber-dam clamp, forming a short circuit, and producing pain thereby. Buccal and other cavities of decay, which extend some distance under the gum, are not always practical cases for cataphoresis, on account of the great difficulty in obtaining perfect insulation. Cavities which have previously been filled with cement or amalgam, on account of the obliterating or closing up of the open ends of the tubuli of the dentin, may prove very stubborn unless the surface of the cavity is burred away or some solvent, as alcohol or a weak acid, is used previously to applying the current.

In teeth where secondary deposits of dentin have taken place, or pulp-nodules exist, satisfactory results are hard to obtain. While a comparatively high potential is required, still it must be borne in mind that too much rather retards than hastens the effect. Dr. Van Woert says the nervous matter in the tubuli of the tooth, by the contact of the current, becomes coagulated if the potential is too high, and the cocain salts become dammed up on the surface. Dr. Gillett advocates making the connection of the negative pole as near the tooth to be operated on as possible, and on mucous membrane, it giving less resistance to the flow. Dr. F. W. Low says, in bleaching with cataphoresis, the negative electrode should be placed in the tooth and the current thereby reversed. Better results in bleaching may be obtained in that way.

There are also dangers connected with cataphoresis which it might be well on occasions like this to mention. These dangers only come through ignorance and carelessness, however, and may be easily avoided. The first to guard against is burns on the flesh under the negative electrode where too much current is used.

Dr. Prothro cited a case where a scar one and one-quarter inches in diameter was burned on a lady's cheek an eighth of an inch deep. Where a fountain spittoon is in use, a ground connection may be made where the street current is used and unpleasant results follow thereby. Dr. Van Woert cited cases where the pulps of the teeth did not gain their former state of translucency for several days, showing the near approach to complete death of same. Dr. Black called attention to the fact that, by the force of the current, micro-organisms might be driven into the soft tissues of the mouth where there was any leakage of the rubber-dam, causing septic poisoning. To obviate this the gums around the parts should be washed with some good antiseptic solution previous to commencing operation.

From the foregoing the deduction may be drawn that cataphoresis is a success, as far as results are concerned, in producing anesthesia of sensitive dentin, or even the pulp itself, where conditions are favorable; that failure may result from inattention to *minute* details; that the favorable cases for perfect success are not more numerous than those of an adverse character; and last, but not least, that where success *is* accomplished the time consumed amounts to quite an item in a *busy* practice.

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